

PART A  
IONOSPHERIC DATA

ISSUED  
OCTOBER 1957

U. S. DEPARTMENT OF COMMERCE  
NATIONAL BUREAU OF STANDARDS  
CENTRAL RADIO PROPAGATION LABORATORY  
BOULDER, COLORADO



## IONOSPHERIC DATA

### CONTENTS

	<u>Page</u>
Symbols, Terminology, Conventions . . . . .	2
Predicted and Observed Sunspot Numbers. . . . .	5
World-Wide Sources of Ionospheric Data. . . . .	6
Erratum . . . . .	8
Examples of Ionospheric Vertical Soundings Godhavn, Greenland; April 21, 1957. . . . .	9
Radio Noise Data . . . . .	11
Tables of Ionospheric Data. . . . .	19
Graphs of Ionospheric Data. . . . .	31
Index of Tables and Graphs of Ionospheric Data in CRPL-F158 (Part A). . . . .	67

## SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1952, and continuing through December 1956, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Sixth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Geneva, 1951. Excerpts concerning symbols and terminology from Document No. 626-E of this Meeting are given on pages 2-7 of the report CRPL-F89, "Ionospheric Data," issued January 1952. Reprints of these pages are available upon request.

Beginning with data for January 1957, the symbols used are given in NBS Report 5033, "Summary of Changes in Ionospheric Vertical Soundings, Observing and Scaling Procedures - Effective 1 January 1957," which draws upon the First Report of the Special Committee on World-Wide Ionospheric Soundings (URSI/AGI), Brussels, Sept. 2, 1956. A list of these symbols is available upon request.

In the Second Report of the Special Committee on World-Wide Ionospheric Soundings of the URSI/AGI Committee, May 1957, a new descriptive letter was introduced:

- M Measurement questionable because the ordinary and extraordinary components are not distinguishable.

There was an expansion in meaning of the following:

- Z (1) (qualifying letter) Measurement deduced from the third magnetoionic component.  
(2) (descriptive letter) Third magnetoionic component present.

Beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

The following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given above.

- a. For all ionospheric characteristics:

Values missing because of A, C, F, H, L, N, R or S are omitted from the median count.



b. For critical frequencies and virtual heights:

Values of  $f_oF_2$  (and  $f_oE$  near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of  $h'F$  (and  $h'E$  near sunrise and sunset) missing for this reason are counted usually as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

Values missing because of G are counted:

1. For  $f_oF_2$ , as equal to or less than  $f_oF_1$ .
2. For  $h'F_2$ , as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic; the descriptive symbol D, only when it replaces a frequency characteristic.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of  $fEs$  missing because of E or G (and B when applied to the daytime E region only) are counted as equal to or less than the median  $f_oE$ , or equal to or less than the lower frequency limit of the recorder.

At night B for  $fEs$  is counted on the low side when there is a numerical value of  $f_oF_2$ ; otherwise it is omitted from the median count.

Values of  $fEs$  missing for any other reason, and values of  $h'Es$  missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If the count is four or less, the data are considered insufficient and no median value is computed.

2. For the F2 layer, h'F or foEs, if the count is from five to nine, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as the count is at least five, the median is not considered doubtful. A count of at least 5 is considered sufficient for an h'Es median.

3. For all layers, if more than half of the data used to compute the medians are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

Ordinarily, a blank space in the fEs or foEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'F2 or h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

- a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.
- b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.
- c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.
- d. The tables may contain median values of either foEs or fEs. The graph of median Es corresponds to the table. Percentage curves of fEs are estimated from values of foEs when necessary.



## WORLD - WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 72 and figures 1 to 144 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Commonwealth of Australia, Ionospheric Prediction Service of the Commonwealth Observatory:

Brisbane, Australia  
Hobart, Tasmania  
Townsville, Australia

Meteorological Service of the Belgian Congo and Ruanda-Urundi:

Elisabethville, Belgian Congo  
Leopoldville, Belgian Congo

British Department of Scientific and Industrial Research, Radio Research Board:

Ibadan, Nigeria (University College of Ibadan)  
Inverness, Scotland  
Port Lockroy  
Singapore, British Malaya  
Slough, England

Defence Research Board, Canada:

Baker Lake, Canada  
Churchill, Canada  
Ottawa, Canada  
Resolute Bay, Canada  
Winnipeg, Canada

Radio Wave Research Laboratories, National Taiwan University, Taipei, Formosa, China:

Formosa, China

Danish National Committee of URSI:

Godhavn, Greenland

Indian Council of Scientific and Industrial Research, Radio Research Committee, New Delhi, India:

Calcutta (Institute of Radio Physics and Electronics)

Ministry of Postal Services, Radio Research Laboratories, Tokyo, Japan:

Akita, Japan  
Tokyo (Kokubunji), Japan  
Wakkanai, Japan  
Yamagawa, Japan

Christchurch Geophysical Observatory, New Zealand Department of  
Scientific and Industrial Research:

Campbell I.  
Rarotonga, Cook Is.  
Scott Base

Norwegian Defence Research Establishment, Kjeller per Lillestrom,  
Norway:

Tromso, Norway

Manila Observatory:

Baguio, P. I.

South African Council for Scientific and Industrial Research:

Capetown, Union of South Africa  
Johannesburg, Union of South Africa  
Nairobi, Kenya (East African Meteorological Department)

Research Institute of National Defence, Stockholm, Sweden:

Kiruna, Sweden  
Lycksele, Sweden  
Upsala, Sweden

Royal Board of Swedish Telegraphs, Radio Department, Stockholm,  
Sweden:

Lulea, Sweden

Post, Telephone and Telegraph Administration, Berne, Switzer-  
land:

Schwarzenburg, Switzerland

United States Army Signal Corps:

Adak, Alaska  
Thule, Greenland  
White Sands, New Mexico

National Bureau of Standards (Central Radio Propagation Lab-  
oratory):

Anchorage, Alaska  
Huancayo, Peru (Instituto Geofisico de Huancayo)  
Panama Canal Zone  
Point Barrow, Alaska  
San Francisco, California (Stanford University)  
Talara, Peru (Instituto Geofisico de Huancayo)  
Washington, D. C.

## ERRATUM

F157(A), p. 18, Table 11 and p. 34, Fig. 22: h'E for hours 07 through 17 should read 150, 110, 100, 100, 100, 100, 105, 100, 100, 105, 120.



# EXAMPLES OF IONOSPHERIC VERTICAL SOUNDINGS Godhavn, Greenland, April 21, 1957

The following ionograms were obtained at the Godhavn, Greenland ionosphere vertical sounding station operated by the Danish URSI Committee. They are typical of day and night conditions for April at this geomagnetic latitude ( $66^{\circ}$ ). Ionospheric data are scaled directly from these records onto the f-plot, a graph of frequency characteristics vs. time. The f-plot for the day represented by these soundings is found on the following page.

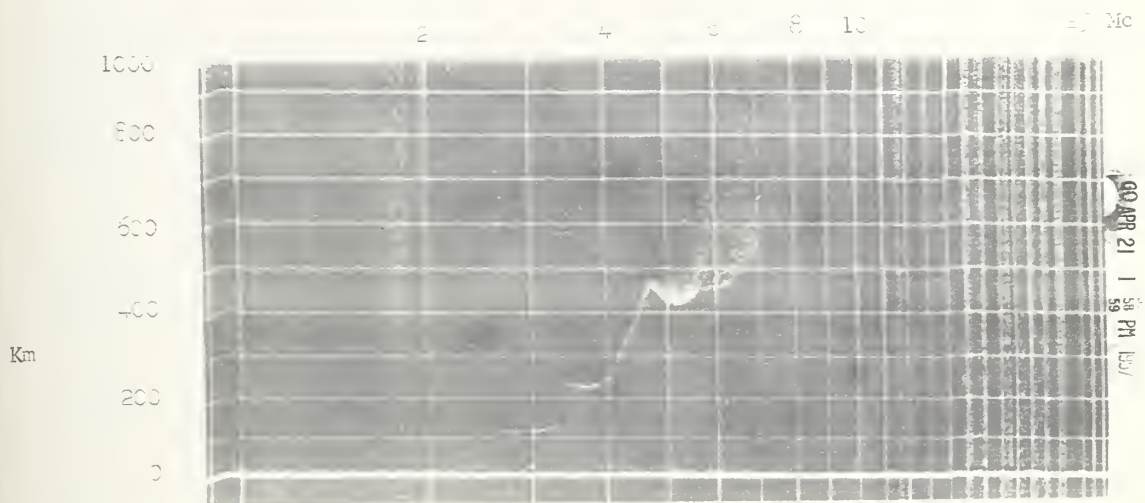


Fig. A. Godhavn, Greenland, April 21, 1957, 1356 hours,  $45^{\circ}$  time.

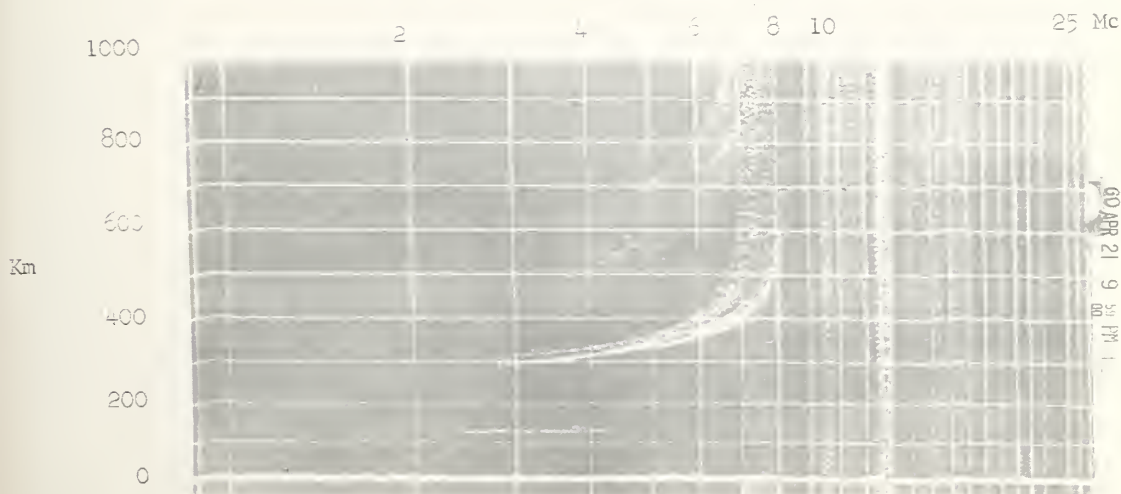
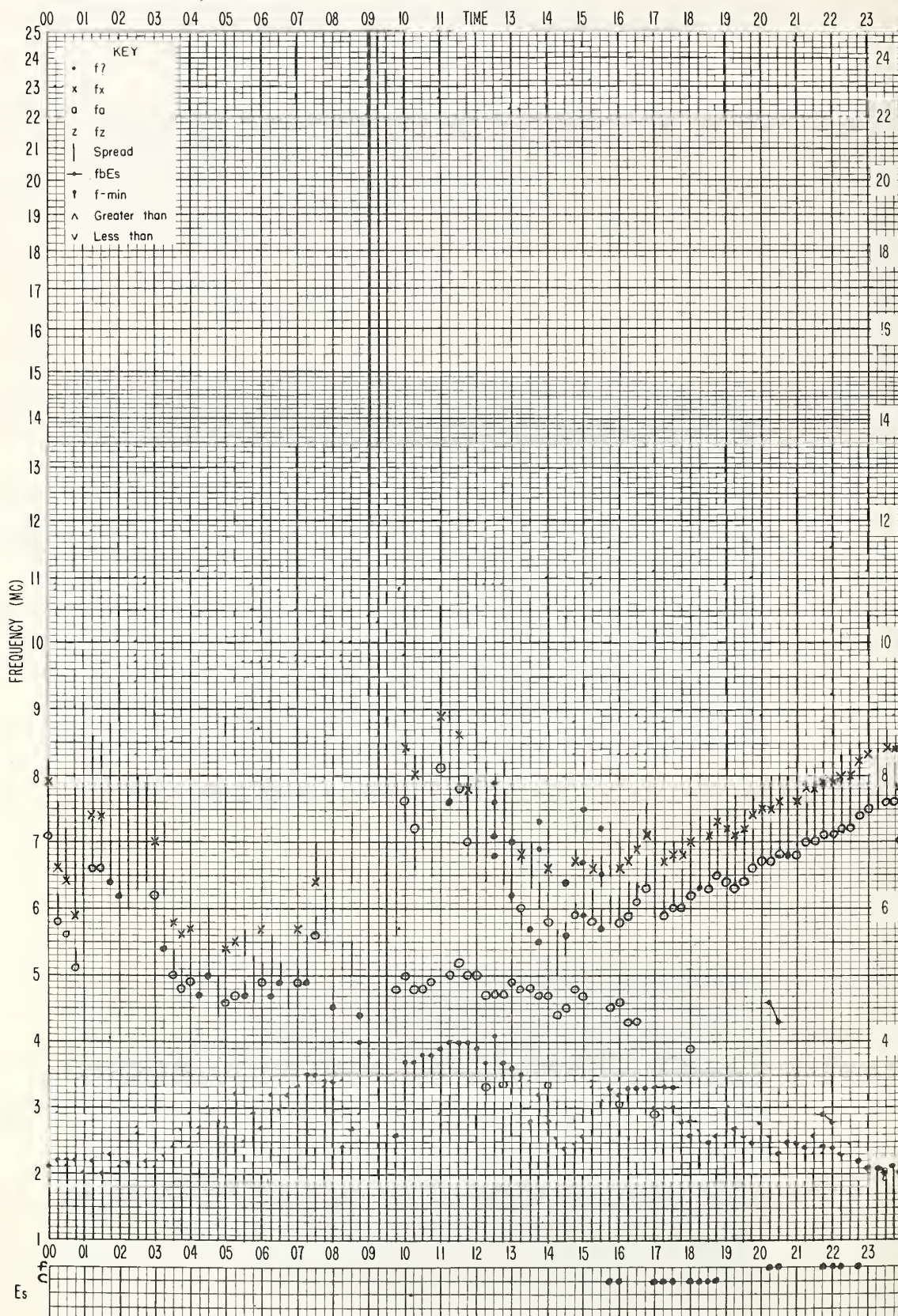


Fig. B Godhavn, Greenland, April 21, 1957, 2155 hours,  $45^{\circ}$  time.

STATION GODHAVN, GREENLAND

f - PLOT OF IONOSPHERIC DATA

DATE 21 APRIL 1957SCALED BY FI, HI



## Radio Noise Data

The results of radio noise measurements are presented in the following graphs and tables. These are based on three parameters of the noise: (1) the mean power, (2) the mean envelope voltage, and (3) the mean logarithm of the envelope voltage. The mean power averaged over a period of several minutes is the basic parameter and is expressed as an effective antenna noise figure,  $F_a$ .  $F_a$  is defined as the noise power available from an equivalent lossless antenna in db above ktb (the thermal noise power available from a passive resistance) where

$k$  = Boltzman's constant ( $1.38 \times 10^{-23}$  joules per degree Kelvin)

$t$  = Absolute room temperature (taken as  $288^\circ$  K)

$b$  = Bandwidth in cycles per second.

The mean voltage and mean logarithm are expressed as deviations,  $V_d$  and  $L_d$  respectively, in db below the mean power.

Measurements of these parameters were made with the National Bureau of Standards Radio Noise Recorder, Model ARN-2, which has an effective noise bandwidth of 280 cycles per second and uses a standard 21.75' vertical antenna. A 15-minute recording is made on each frequency each hour, and these 15-minute samples are taken as representing the noise conditions for the full hour. The month-hour medians,  $F_{am}$ ,  $V_{dm}$ , and  $L_{dm}$  are determined from these hourly values for each of the corresponding parameters and the resulting medians are plotted at the half-hour point on the curves. Normally from 25 to 30 observations of the mean power are obtained monthly for each hour of the day, and from 10 to 15 observations of the voltage and logarithm deviations. When there are fewer than 15 observations of the mean power, or 7 observations of the voltage and logarithm deviations, the tabulated values are identified by an asterisk (\*).

The upper and lower decile values of  $F_a$  are also reported in the following tabulation to give an indication of the extent of the variation of the noise power from day to day at a given time of day. These are expressed in db above and below the month-hour median,  $F_{am}$ , and designated by  $D_u$  and  $D_l$  respectively.

Information on expected worldwide noise levels and their application to systems problems is presented in NBS Circular 557 (available from the Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D. C.). More recent estimates of radio noise levels are given in CCIR Report No. 65, "Report on Revision of Atmospheric Radio Noise Data", Warsaw, 1956 (available from the International Telecommunication Union, Geneva).

Comparisons are made in this issue between observed time-block median values of noise for the past season and predicted values taken from CCIR Report No. 65. A "time-block median" is the median of all values obtained during a four-hour period of the day for an entire season.

## RADIO NOISE DATA

Station Boulder, Colorado Lat 40.1°N Long 105.1°W Type Recorder ARN-2 Month August 19 57

## Local Mean Time

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
51kc																								
F <sub>om</sub>	142	140	140	140	138	134	134	132	130	134	*132	137	141	144	144	144	146	144	144	144	144	142	142	142
D <sub>u</sub>	2	4	2	2	2	6	4	6	6	5		6	6	6	8	8	6	10	7	6	5	8	7	4
D <sub>ℓ</sub>	4	2	4	6	4	4	6	6	7	6		6	6	6	5	4	6	4	6	6	5	3	4	4
V <sub>dm</sub>	7.5	8.0	7.5	7.0	9.0	9.5	10.5	11.0	11.0	*10.0	*9.5	11.5	11.0	9.5	8.5	8.5	8.0	8.0	8.5	7.5	7.5	8.0	7.5	7.0
L <sub>dm</sub>	13.5	14.5	12.5	14.0	16.0	15.0	17.5	18.5	19.0	*19.0	*17.0	19.0	19.0	17.0	16.0	17.0	16.0	14.5	15.0	13.5	13.0	15.5	14.0	15.5
113kc																								
F <sub>om</sub>	127	126	126	124	122	118	116	114	112	112	*114	116	126	130	130	132	132	132	134	132	131	128	128	128
D <sub>u</sub>	4	4	4	4	4	6	6	10	13	12		16	8	8	10	10	10	14	4	7	7	10	9	6
D <sub>ℓ</sub>	7	6	6	4	5	10	12	12	7	9		5	8	8	6	6	6	7	10	8	7	4	4	6
V <sub>dm</sub>	7.0	7.0	6.0	6.5	8.5	9.5	11.0	11.0	*12.5	*11.0	*11.0	11.0	11.5	11.0	10.0	10.0	9.0	9.0	9.0	8.0	6.5	7.0	7.0	7.0
L <sub>dm</sub>	12.5	12.0	11.5	12.5	15.5	18.0	20.0	20.0	*18.0	*18.0	*16.5	19.5	19.0	19.5	19.0	18.0	19.0	17.0	16.5	14.5	12.0	14.0	13.5	14.0
246kc																								
F <sub>om</sub>	110	110	108	108	104	100	98	96	94	92	93	100	110	112	117	118	120	118	116	116	114	112	111	110
D <sub>u</sub>	6	6	6	2	4	4	8	12	16	14	19	21	8	12	15	12	8	11	8	12	9	12	12	9
D <sub>ℓ</sub>	6	6	6	6	13	20	18	16	20	16	11	9	18	13	11	10	12	10	13	9	6	6	5	6
V <sub>dm</sub>	6.0	6.5	6.5	6.0	9.5	10.0	10.5	11.0	*9.5	*8.0	*8.5	12.0	11.0	11.0	10.5	9.5	9.5	10.0	10.0	6.5	6.0	6.0	6.0	6.5
L <sub>dm</sub>	12.0	12.0	12.0	13.0	15.5	17.0	18.5	19.5	*16.0	*14.0	*13.0	20.0	20.0	20.5	20.5	18.5	19.5	19.0	18.0	13.5	12.5	12.0	13.0	13.0
545kc																								
F <sub>om</sub>	98	98	96	96	84	82	78	83	80	*76	81	84	98	98	104	107	104	102	102	102	98	98	99	98
D <sub>u</sub>	6	6	4	4	14	6	8	15	17		15	22	12	13	16	9	14	13	10	13	6	11	9	6
D <sub>ℓ</sub>	4	6	6	6	8	10	4	9	6		9	10	22	19	14	18	13	16	18	8	4	4	4	5
V <sub>dm</sub>	6.0	5.0	6.0	6.5	6.0	*2.0	4.5	*3.5	*1.5	*3.5	*7.0	*5.5	9.0	10.5	9.0	10.0	10.0	11.0	7.0	5.5	5.0	5.0	4.5	6.0
L <sub>dm</sub>	12.5	11.5	11.0	14.0	12.0	*4.0	10.0	*8.0	*4.0	*6.0	*15.0	*9.0	13.5	21.5	18.5	20.0	18.5	21.0	13.5	11.0	9.5	9.5	10.0	12.0
2.5Mc																								
F <sub>om</sub>	72	71	70	70	68	58	50	46	48	49	48	50	54	57	62	66	66	64	68	74	74	74	74	74
D <sub>u</sub>	7	6	6	8	8	8	10	12	10	10	10	19	23	25	16	18	13	18	13	6	14	12	10	5
D <sub>ℓ</sub>	4	5	4	4	9	10	6	4	6	4	4	4	8	11	14	14	15	12	11	9	4	4	6	6
V <sub>dm</sub>	3.0	2.5	3.5	3.0	4.5	6.0	3.5	*1.0	*1.0	*2.0	*4.0	3.0	5.0	6.0	5.0	5.5	5.0	5.5	3.5	2.5	2.5	2.5	2.5	2.5
L <sub>dm</sub>	6.5	7.5	8.5	8.0	9.5	11.0	6.5	*3.0	*2.0	*4.0	*6.0	5.0	12.5	15.0	12.0	12.0	12.0	9.5	8.5	5.5	6.0	6.0	6.5	6.0
5Mc																								
F <sub>om</sub>	64	64	64	62	62	54	46	42	42	40	44	44	47	46	50	54	54	56	62	66	66	66	64	64
D <sub>u</sub>	6	6	6	8	6	8	9	7	7	11	8	8	17	18	30	18	13	16	10	10	11	11	7	7
D <sub>ℓ</sub>	4	6	5	3	5	7	3	4	5	4	8	8	9	6	8	8	5	4	6	4	5	4	4	4
V <sub>dm</sub>	2.5	3.0	2.0	3.0	3.0	4.5	*4.0	2.5	*2.0	*1.5	*3.0	2.5	5.0	5.5	4.5	4.0	3.0	4.0	2.0	2.5	2.5	1.5	2.5	2.5
L <sub>dm</sub>	7.0	6.5	6.5	8.0	8.0	9.5	*8.0	4.5	*4.0	*3.5	*4.0	4.0	10.0	9.5	13.5	8.5	8.0	8.0	5.5	6.0	6.0	6.5	6.5	6.0
10Mc																								
F <sub>om</sub>	46	46	46	46	44	44	42	40	35	34	34	34	38	40	44	46	48	50	52	52	50	50	48	46
D <sub>u</sub>	8	6	6	7	9	7	9	6	12	10	7	10	12	12	12	14	8	9	9	7	8	12	8	8
D <sub>ℓ</sub>	5	5	2	3	2	4	6	10	6	7	7	4	6	6	8	7	4	3	3	3	2	4	4	4
V <sub>dm</sub>	2.5	3.0	2.5	2.0	4.0	3.5	4.5	4.5	4.0	*5.5	*3.5	4.0	5.0	3.5	4.5	4.0	2.5	2.5	2.0	2.5	3.0	3.5	3.0	3.5
L <sub>dm</sub>	6.0	7.0	6.0	5.5	8.0	8.0	9.0	9.0	7.0	*9.0	*7.0	8.0	11.0	7.0	10.0	7.0	6.5	6.0	5.5	6.0	7.0	7.0	6.0	7.0
20Mc																								
F <sub>om</sub>	23	23	23	23	23	25	25	25	25	25	25	25	27	27	29	31	31	31	31	27	25	25	25	23
D <sub>u</sub>	8	8	7	7	7	8	8	9	10	10	10	10	10	12	14	12	10	11	11	15	18	14	8	8
D <sub>ℓ</sub>	3	4	4	4	4	4	4	4	6	2	3	4	6	4	4	5	4	3	4	3	2	2	4	3
V <sub>dm</sub>	*1.0	*1.0	*1.0	*1.0	*1.0	2.0	*2.0	*1.5	*1.5	*2.0	*1.5	2.5	2.5	3.0	4.0	2.5	3.0	2.5	3.0	2.5	2.5	2.0	1.5	1.0
L <sub>dm</sub>	*2.5	*2.5	*3.0	*2.5	*2.5	3.5	*4.5	*4.0	*4.0	*5.0	*4.0	5.0	8.5	6.0	8.0	5.5	5.5	5.0	6.0	4.0	4.0	4.0	3.0	2.5

## SEASONAL VALUES OF RADIO NOISE

LAT. 43N LONG. 105W STATION Bill, WyomingSEASON Summer ( July ) 19 57

FREQUENCY (Mc)	TIME BLOCKS (LMT)																	
	0000-0400			0400-0800			0800-1200			1200-1600			1600-2000			2000-2400		
	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>
.051	142			135			131			141			144	9	7	144	4	8
.113	126			114			111			125	10	12	128	10	12	128	5	8
.246	109			96			91			112	8	20	114	12	21	112	6	8
.545	88			67			74			96			96			92		
2.5	73	5	8	40	12	8	26	10	4	59	14	38	60	14	24	71	6	8
5.0	65	4	4	46	6	12	26	12	6	43	13	23	54	6	18	66	4	5
10.0	47	6	4	42	5	7	31			39	7	9	46	4	5	52	3	6
20.0	28	4	4	28	5	4	26			28	6	4	31	5	6	28	4	4

LAT. 40N LONG. 105W STATION Boulder, ColoradoSEASON Summer ( June - Aug. ) 19 57

FREQUENCY (Mc)	TIME BLOCKS (LMT)																	
	0000-0400			0400-0800			0800-1200			1200-1600			1600-2000			2000-2400		
	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>	F <sub>am</sub>	D <sub>u</sub>	D <sub>l</sub>
.051	140	5	5	133	5	6	132	3	4	142	8	6	144	7	7	143	6	6
.113	125	5	6	116	7	10	113	7	5	128	10	12	132	8	11	129	7	8
.246	110	7	8	97	8	15	94	11	10	113	14	16	118	9	14	114	8	8
.545	93	7	8	78	10	7	80	16	9	100	14	20	102	10	18	98	7	7
2.5	72	6	5	52	6	6	47	8	3	60	17	12	65	11	13	73	6	5
5.0	63	4	4	49	5	5	43	6	6	50	17	8	57	9	6	65	6	4
10.0	45	4	4	40	6	4	32	8	6	40	10	7	49	5	4	48	5	4
20.0	22	4	3	22	5	3	23	9	3	26	11	5	27	8	4	23	7	2

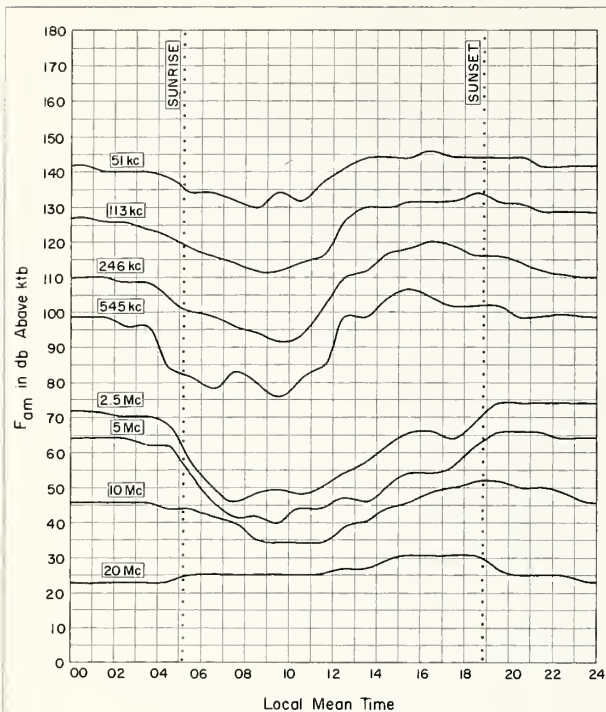
F<sub>am</sub> = Time block median value of effective antenna noise figure in db above ktbD<sub>u</sub> = Ratio of upper decile to median in dbD<sub>l</sub> = Ratio of median to lower decile in dbLAT. 40N LONG. 105W STATION Boulder, ColoradoSEASON Summer ( June - Aug. ) 19 57

FREQUENCY (Mc)	TIME BLOCKS (LMT)																	
	0000-0400			0400-0800			0800-1200			1200-1600			1600-2000			2000-2400		
	V <sub>dm</sub>	L <sub>dm</sub>		V <sub>dm</sub>	L <sub>dm</sub>		V <sub>dm</sub>	L <sub>dm</sub>		V <sub>dm</sub>	L <sub>dm</sub>		V <sub>dm</sub>	L <sub>dm</sub>		V <sub>dm</sub>	L <sub>dm</sub>	
.051	6.5	13.0		9.5	17.0		11.5	19.0		9.5	15.5		8.0	13.5		7.0	13.0	
.113	6.0	12.5		9.5	18.5		12.0	20.0		10.0	17.5		8.0	15.0		7.0	12.0	
.246	6.5	12.0		9.5	17.5		11.5	18.5		10.0	18.5		8.0	15.0		6.0	11.5	
.545	5.5	11.5		5.5	10.5		6.5	11.5		9.5	17.5		8.0	15.0		5.0	10.0	
2.5	3.5	8.5		3.0	7.5		2.0	4.0		7.0	13.0		5.0	10.5		3.5	8.0	
5.0	3.5	8.0		4.0	7.5		1.5	4.0		5.0	11.0		3.0	7.5		3.0	7.5	
10.0	3.5	7.0		4.5	8.5		4.5	7.0		4.5	9.0		3.0	6.5		3.5	7.5	
20.0	1.0	3.0		1.5	4.0		2.5	5.0		3.5	6.0		3.0	6.0		2.0	3.5	

V<sub>dm</sub> = Time block median value of deviation of mean envelope voltage below mean power in db.L<sub>dm</sub> = Time block median value of deviation of mean logarithm of voltage below mean power in db.

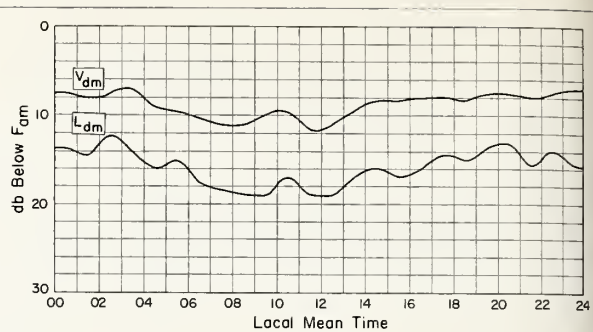


## GRAPHS OF RADIO NOISE DATA



BOULDER, COLORADO

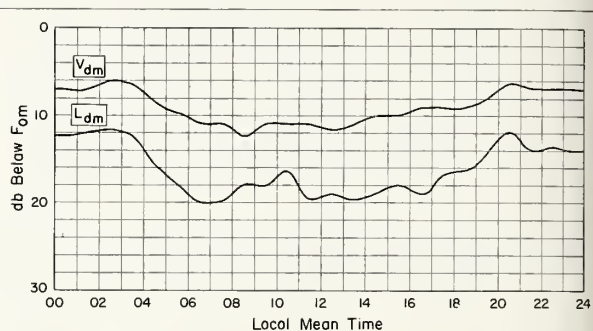
AUGUST 1957



51 kc

BOULDER, COLORADO

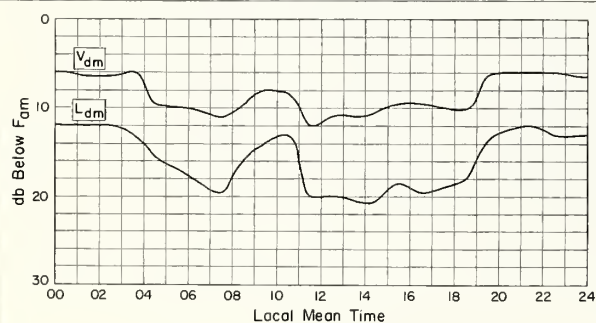
AUGUST 1957



113 kc

BOULDER, COLORADO

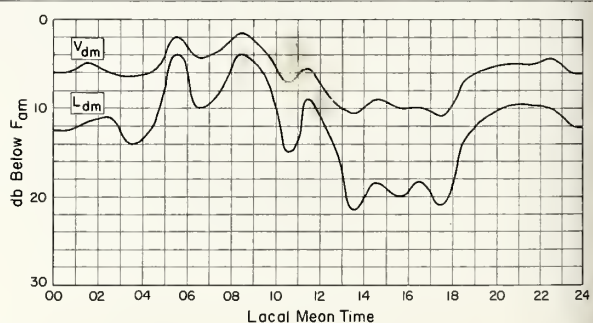
AUGUST 1957



246 kc

BOULDER, COLORADO

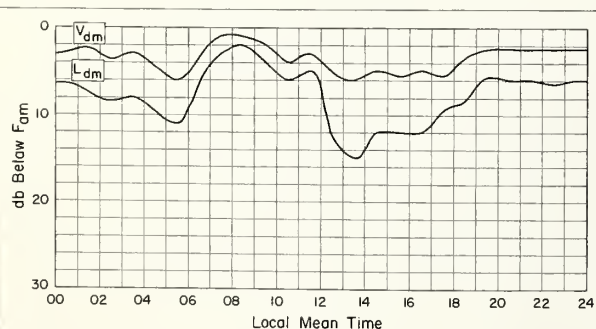
AUGUST 1957



545 kc

BOULDER, COLORADO

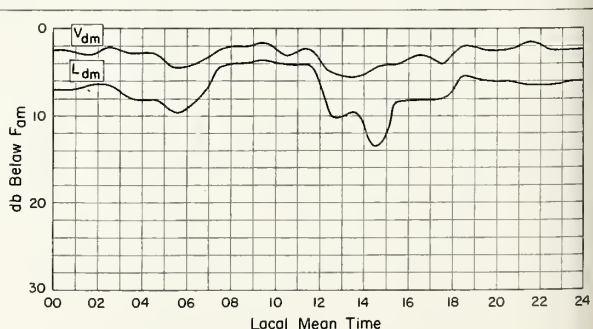
AUGUST 1957



2.5 Mc

BOULDER, COLORADO

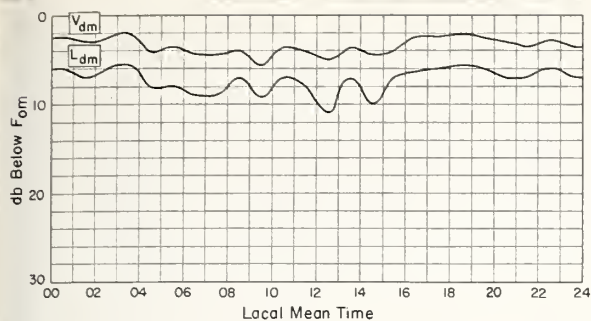
AUGUST 1957



5 Mc

BOULDER, COLORADO

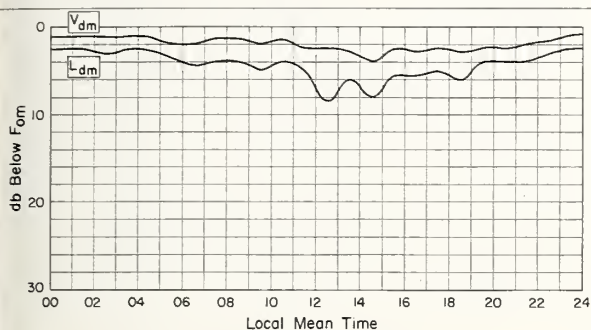
AUGUST 1957



10 Mc

BOULDER, COLORADO

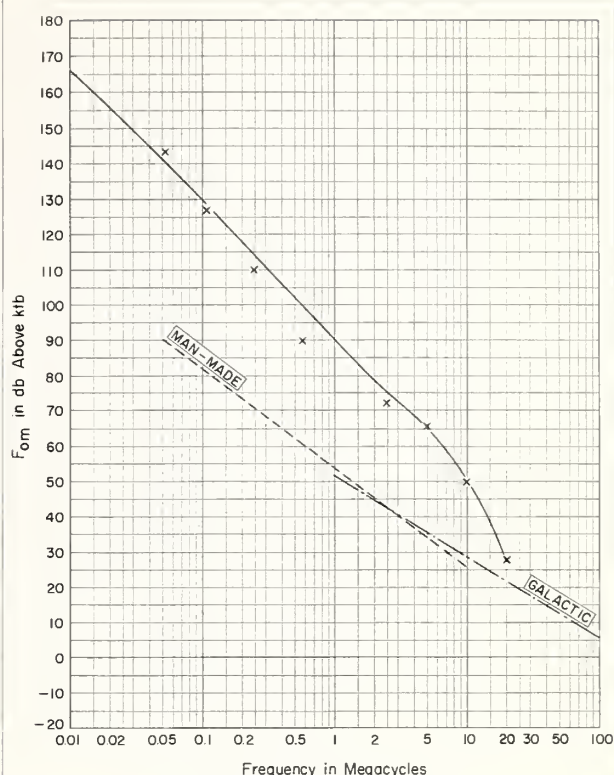
AUGUST 1957



20 Mc

BOULDER, COLORADO

AUGUST 1957

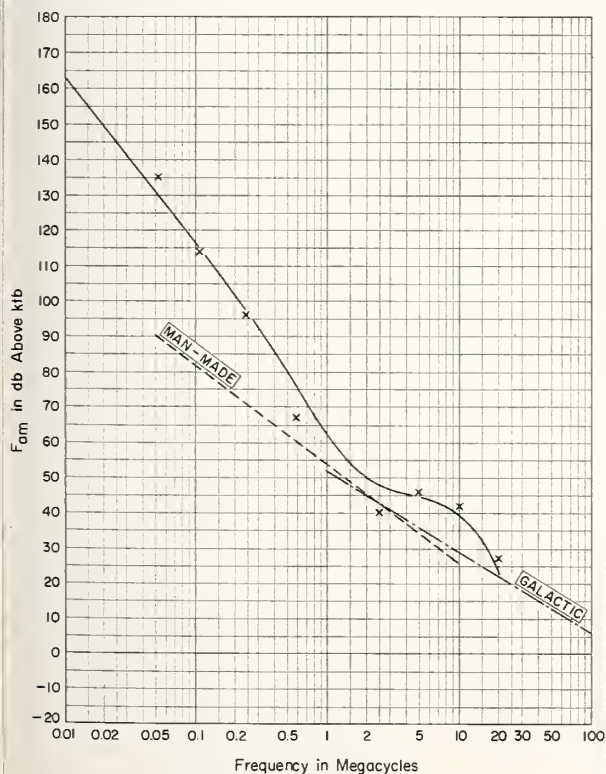


RADIO NOISE FOR SUMMER SEASON

Time Block: 0000-0400 & 2000-2400, June-July-August, 1957  
Bill, Wyoming

Observed: x x x

Predicted: —



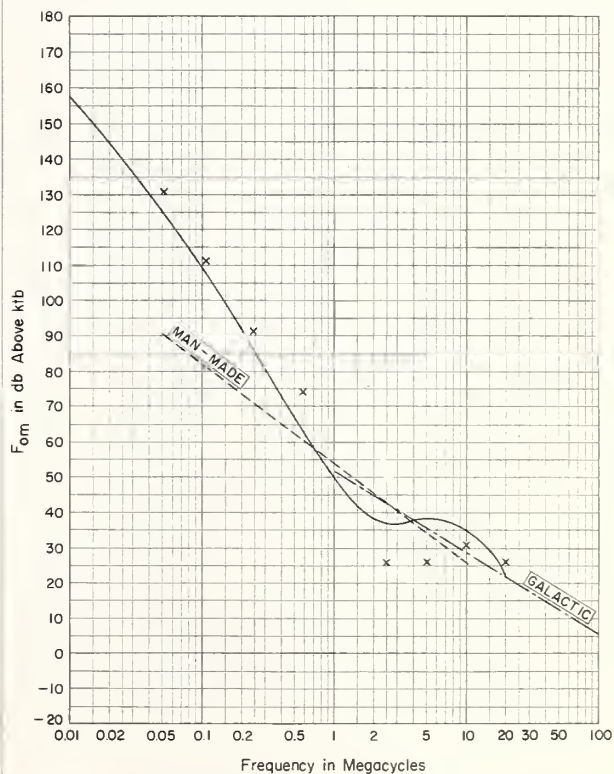
RADIO NOISE FOR SUMMER SEASON

Time Block: 0400-0800, June-July-August, 1957

Bill, Wyoming

Observed: x x x

Predicted: —



RADIO NOISE FOR SUMMER SEASON

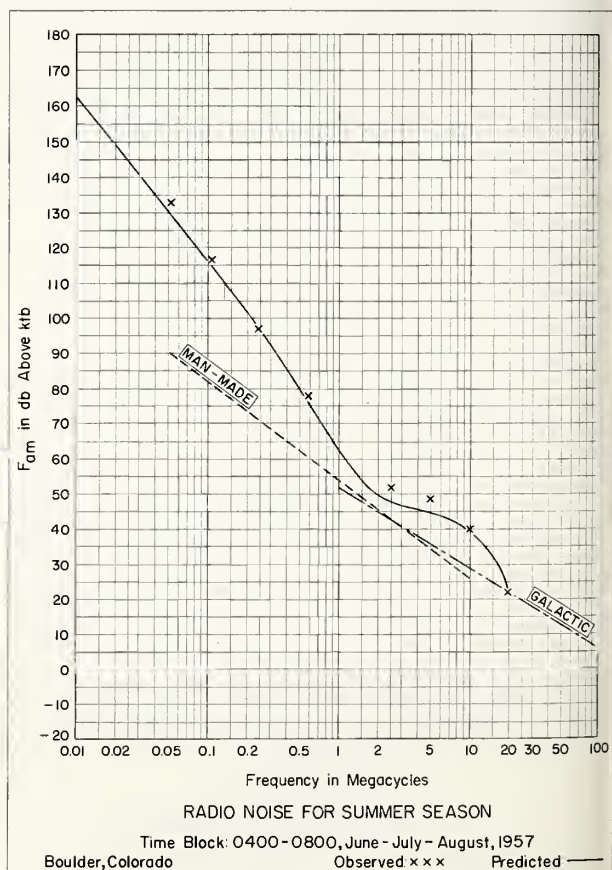
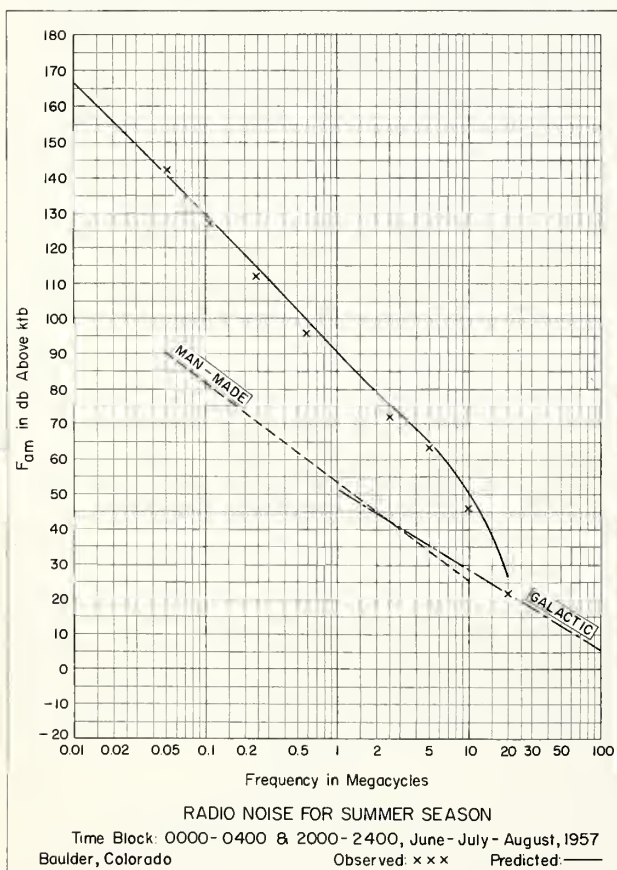
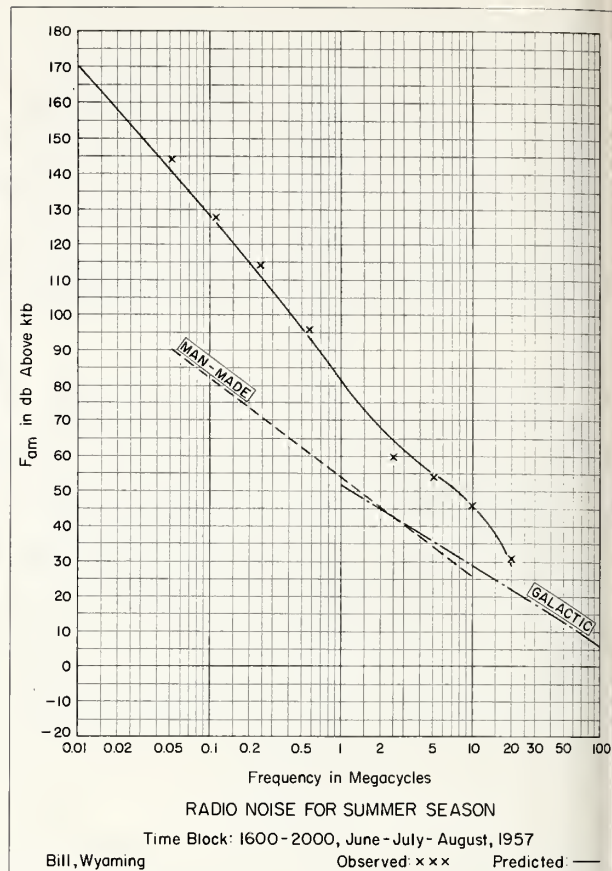
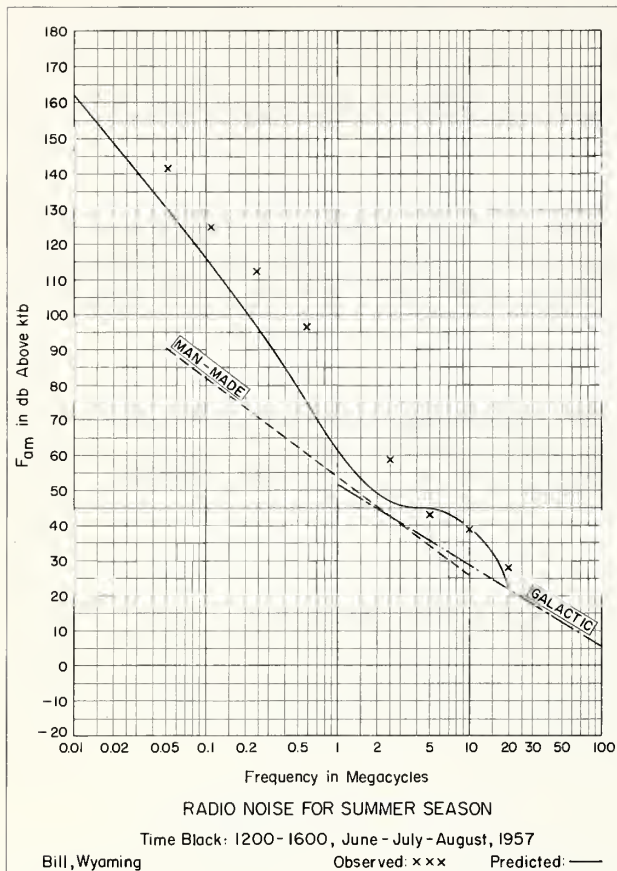
Time Block: 0800-1200, June-July-August, 1957

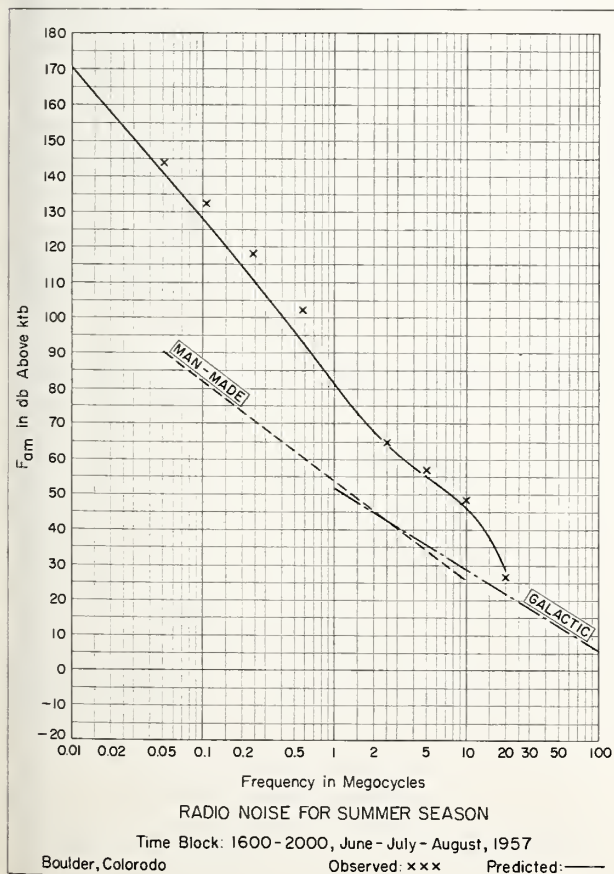
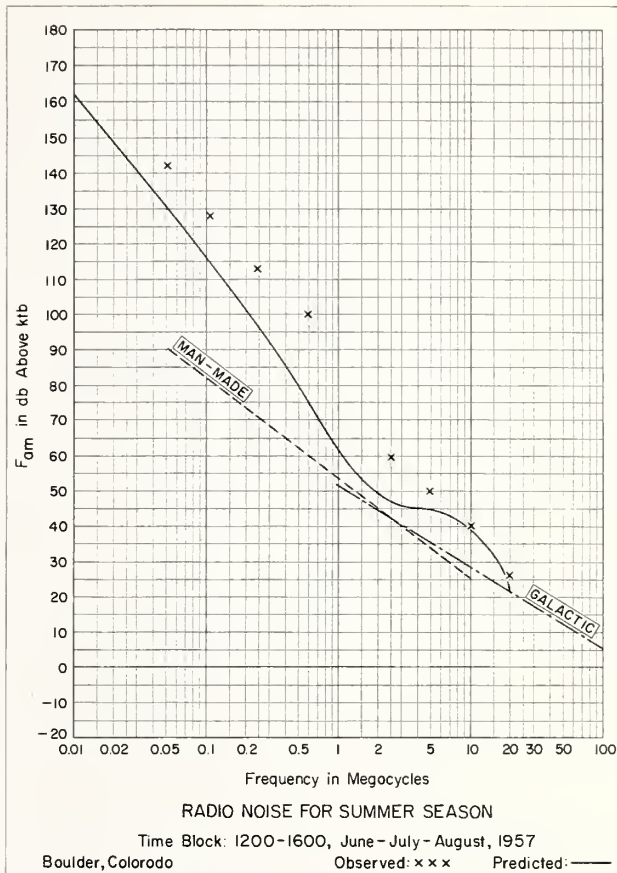
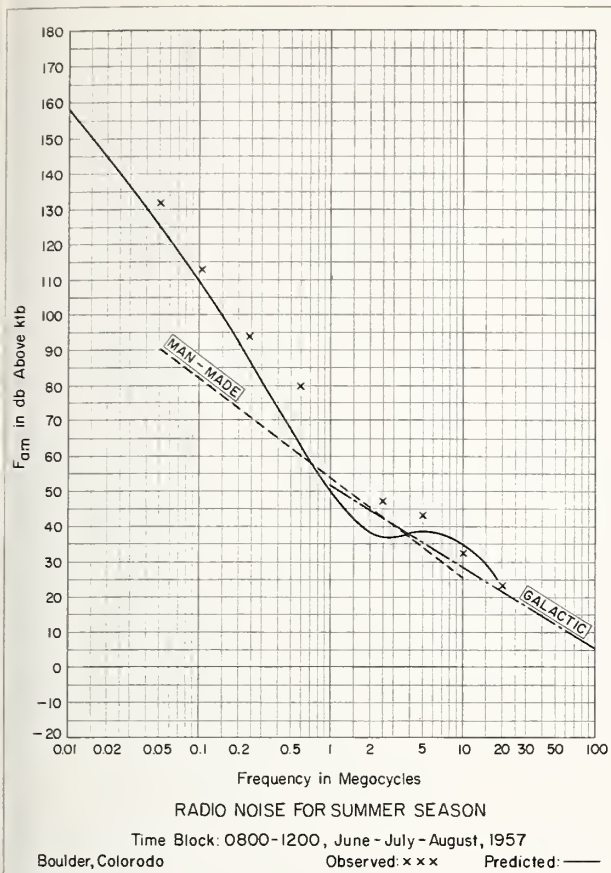
Bill, Wyoming

Observed: x x x

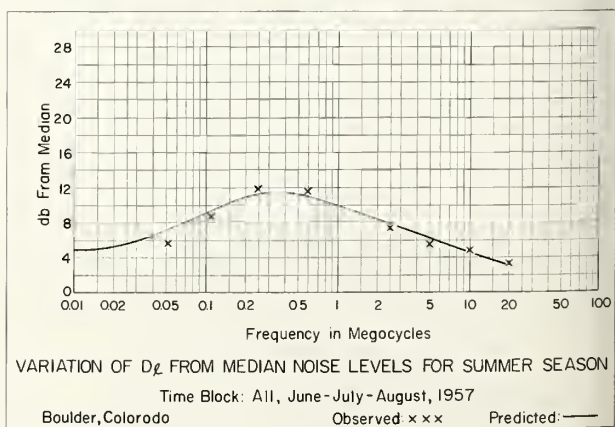
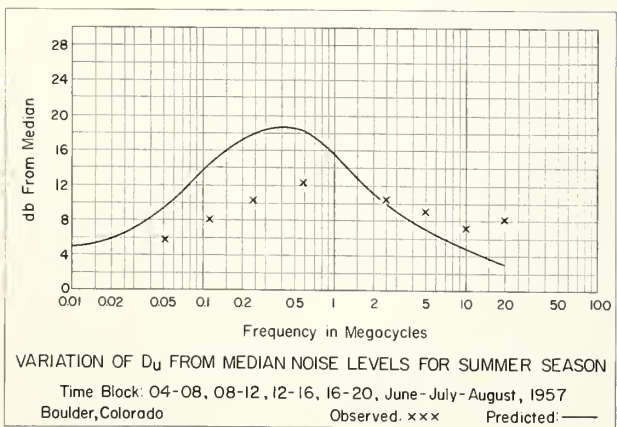
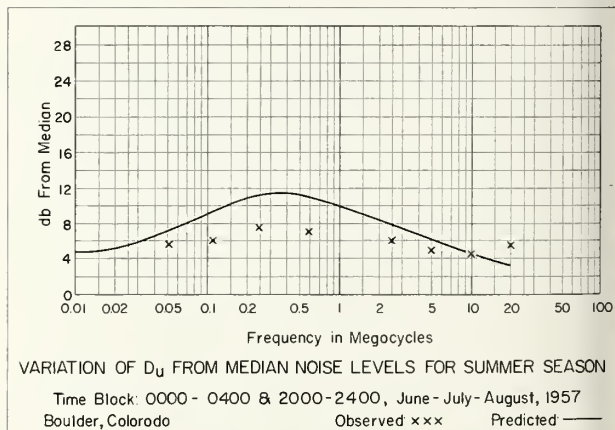
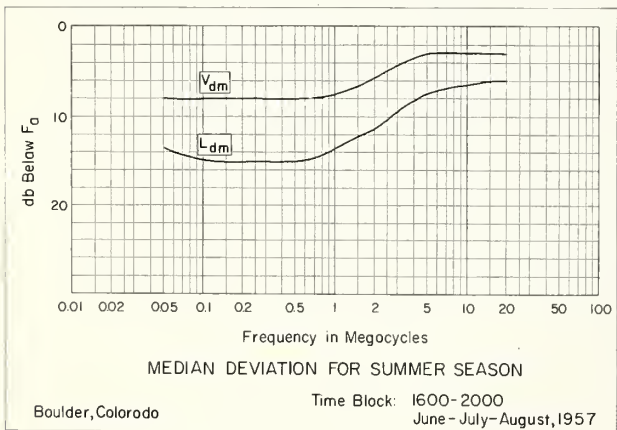
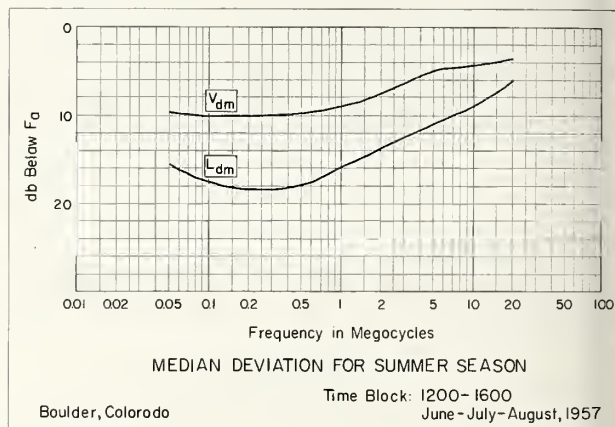
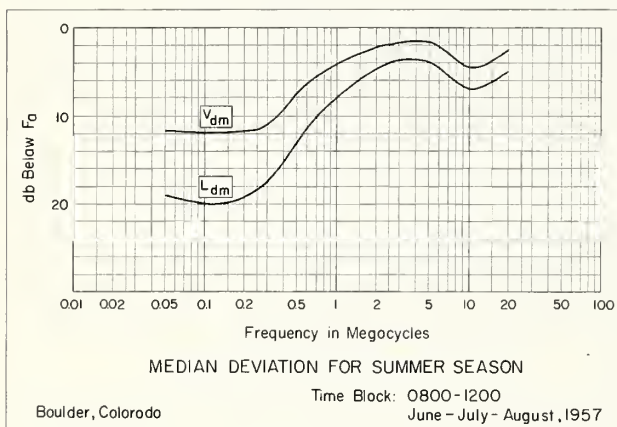
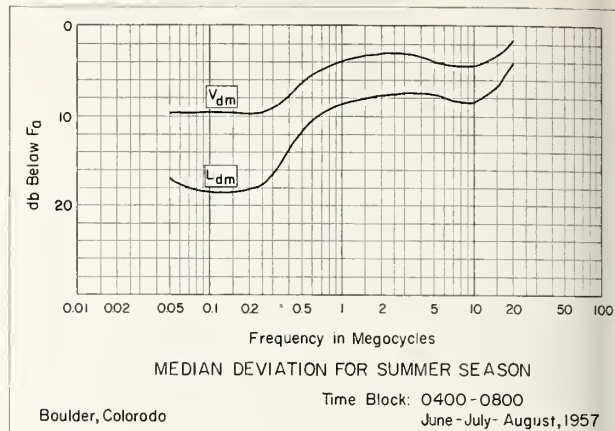
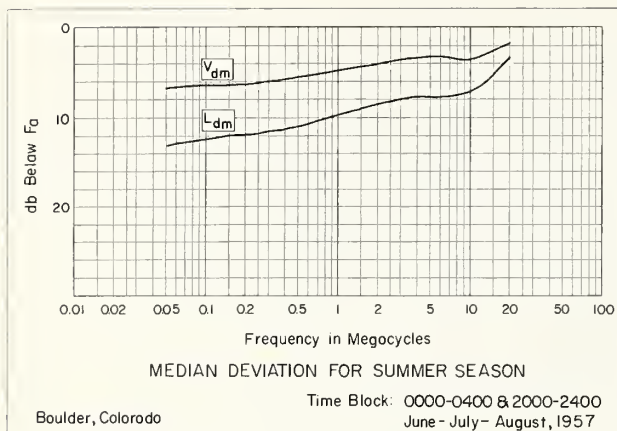
Predicted: —













## TABLES OF IONOSPHERIC DATA

19

Table 1

Upsala, Sweden (59.8°N, 17.6°E)							
August 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		5.6	315				3.2
01		5.2	310				3.9
02		5.0	310				3.5
03		4.6	305				3.8
04	---	4.8	290	----	---	E	4.5
05	(345)	5.5	260	3.60	125	2.10	4.5
06	370	6.1	245	4.20	115	2.50	5.3
07	330	6.9	240	4.70	110	2.90	5.5
08	390	7.3	240	5.00	110	3.20	5.2
09	345	7.5	230	5.20	105	3.40	6.5
10	360	7.6	230	5.30	105	3.50	6.6
11	375	7.7	220	5.40	105	3.60	6.7
12	380	7.7	220	5.50	105	3.60	6.0
13	375	7.7	225	5.50	105	3.60	6.3
14	380	7.4	230	5.50	105	3.50	6.3
15	360	7.5	230	5.30	105	3.40	5.2
16	340	7.7	240	5.00	110	3.20	5.6
17	300	7.7	245	4.50	110	2.90	5.0
18	300	7.7	260	3.85	120	2.40	4.5
19		7.6	265	----	125	1.80	3.9
20		7.6	260	----	---	E	3.3
21		6.8	265	----	---	E	3.3
22		6.3	290				3.2
23		6.1	300				3.0

Time: 15.0°E.

Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 2

Formosa, China (25.0°N, 121.5°E)							
August 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		12.6	280				3.0
01		13.2	260				2.9
02		13.0	240				2.5
03		10.4	240				2.2
04		8.9	240				3.1
05		7.6	240				2.4
06		8.6	250			(2.2)	2.4
07		9.5	230			(3.1)	3.8
08		9.9	220				3.6
09	---	10.0	220	---		(4.0)	5.8
10	---	11.4	220	(6.2)		(4.3)	6.0
11	380	12.6	220	(6.3)		---	5.4
12	370	13.5	220	(6.4)		---	5.6
13	380	14.0	220	(6.4)		4.4	6.0
14	370	14.7	220	(6.2)		(4.3)	5.0
15	360	15.4	220	(5.9)		(4.1)	4.9
16	(320)	15.4	220	---		(3.7)	5.1
17	(310)	15.5	240			(3.2)	4.6
18	---	15.3	260			2.5	4.4
19		14.9	270			---	4.2
20		14.5	280				3.7
21		>13.6	280				3.1
22		>14.3	280				2.4
23		13.7	280				2.8

Time: 120.0°E.

Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 3

Kiruna, Sweden (67.8°N, 20.3°E)							
July 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.4	(350)				(3.3)
01	---	5.8	(330)	---	---	---	(3.3)
02	(395)	5.4	(300)	3.0	---	1.9	(2.8)
03	420	6.0	(275)	3.5	---	2.0	(3.1)
04	(410)	6.0	250	4.0	110	2.2	2.4
05	425	6.0	245	4.1	105	2.6	2.5
06	450	6.1	240	4.4	105	2.9	2.5
07	405	6.1	240	4.7	105	3.0	2.5
08	440	6.5	230	5.0	100	3.2	2.5
09	430	7.0	230	5.0	105	3.2	2.5
10	450	7.0	225	5.1	105	3.3	2.5
11	440	6.9	220	5.1	105	3.4	2.5
12	470	6.7	220	5.2	100	3.4	2.5
13	460	6.5	215	5.2	105	3.3	2.5
14	440	6.4	220	5.1	105	3.2	2.5
15	455	6.4	220	5.1	105	3.2	2.55
16	440	6.4	230	5.0	105	3.0	2.6
17	480	6.2	235	4.7	105	2.9	2.6
18	---	6.2	245	---	110	2.8	2.7
19	---	6.1	250	---	110	2.2	(3.0)
20	---	6.3	265	---	110	2.1	(2.8)
21	---	6.0	280	---	---	1.9	(3.0)
22		5.9	335				(3.0)
23		5.8	310				(3.0)

Time: 15.0°E.

Sweep: 0.8 Mc to 14.0 Mc in 30 seconds.

Table 4

Lycksele, Sweden (64.6°N, 18.8°E)							
July 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.2	310				2.6
01		5.9	320			E	2.5
02	(365)	5.8	315	2.90	---	E	2.8
03	330	6.2	280	3.10	105	1.80	2.2
04	355	6.2	250	3.70	105	2.20	2.6
05	385	6.4	240	4.10	105	2.50	2.6
06	390	6.5	230	4.50	105	2.90	2.6
07	390	6.7	230	4.80	105	3.05	3.5
08	420	6.8	230	5.00	105	3.25	3.6
09	400	7.3	225	5.10	105	3.40	3.8
10	405	7.2	220	5.35	105	3.40	3.9
11	425	7.2	220	5.50	105	3.50	3.8
12	410	7.1	215	5.40	105	3.60	3.8
13	425	7.2	215	5.35	105	3.50	2.5
14	420	7.2	215	5.30	105	3.40	2.6
15	380	7.0	215	5.20	105	3.30	2.6
16	370	6.9	225	5.10	105	3.20	2.6
17	340	7.0	230	4.80	105	3.00	2.7
18	330	6.9	230	4.50	105	2.70	3.1
19	290	6.9	250	3.80	110	2.35	3.4
20	290	6.9	260	3.50	115	1.90	2.8
21	---	6.8	270	---	---	E	2.2
22		6.6	290				2.6
23		6.4	300				2.55

Time: 15.0°E.

Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 5

Upsala, Sweden (59.8°N, 17.6°E)							
July 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.7	310				2.6
01		6.4	315		---	----	2.8
02		6.2	310		---	E	3.0
03	(365)	6.2	300	2.85	---	1.55	3.0
04	370	6.4	270	3.60	125	2.10	3.4
05	400	6.5	250	4.20	110	2.55	3.5
06	435	6.4	240	4.50	105	2.90	3.6
07	440	6.8	240	4.90	105	3.15	4.6
08	420	7.1	240	5.10	105	3.40	4.6
09	410	7.3	230	5.40	105	3.55	5.0
10	415	7.6	220	5.50	105	3.65	5.6
11	430	7.6	210	5.50	105	3.75	6.0
12	440	7.4	220	5.60	105	3.75	4.7
13	450	7.3	220	5.50	105	3.70	4.2
14	450	7.3	220	5.50	105	3.60	4.8
15	420	7.2	225	5.30	105	3.50	4.3
16	400	7.1	230	5.30	105	3.40	3.6
17	390	7.2	240	4.95	105	3.20	3.6
18	370	7.1	250	4.50	110	2.85	3.5
19	300	7.2	260	3.90	115	2.50	3.6
20	---	7.1	275	----	140	1.80	3.1
21		7.0	280		---	E	2.6
22		7.0	290		---	E	2.2
23		7.0	295				2.5

Time: 15.0°E.

Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 6

Washington, D. C. (38.7°N, 77.1°W)							
July 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.6	280				3.6
01		6.2	<280				3.8
02		5.8	280				3.7
03		5.4	275				4.0
04		5.0	<290				4.3
05		5.2	290				1.7
06	(290)	6.0	250	---	---	----	2.5
07	340	6.6	240	4.6	109	(3.00)	3.5
08	410	6.8	230	5.0	105	3.35	3.9
09	420	6.8	220	5.1	104	(3.60)	4.2
10	455	6.9	205	5.5	103	(3.85)	4.6
11	440	7.0	210	5.5	103	(3.95)	4.3
12	440	7.0	210	5.5	103	4.00	4.3
13	450	7.2	210	(5.5)	105	4.00	4.3
14	450	7.2	215	5.4	105	4.00	4.2
15	440	7.3	220	5.4	109	3.80	2.55
16	420	7.3	225	5.2	109	3.60	2.60
17	380	7.5	230	(4.9)	109	3.25	2.70
18	355	7.6	240	---	111	2.80	3.0
19	---	7.7	270		121	(2.00)	2.2
20		7.4	260				3.6
21		7.2	270				3.8
22		7.2	275				4.3
23		6.8	280				3.7

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 7

Thule, Greenland (76.6°N, 68.7°W)								June 1957
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00	(440)	5.8	240	3.7	109	2.35		2.60
01	440	5.6	250	3.8	107	(2.45)		2.65
02	(500)	5.4	240	4.0	103	2.60		2.75
03	520	5.6	230	4.0	103	2.70		2.65
04	(490)	5.9	230	4.0	102	2.80		2.80
05	495	5.8	230	4.3	101	3.00		2.60
06	500	5.8	220	4.4	101	3.10		2.50
07	510	5.6	225	4.6	101	3.20	3.4	2.40
08	550	5.9	215	4.7	101	3.30		2.45
09	600	5.2	220	4.8	101	3.40		G
10	540	5.6	210	4.8	101	3.50	4.2	2.35
11	G	5.0	210	4.8	103	3.50	3.8	G
12	600	5.3	215	4.8	101	3.50	4.6	2.10
13	590	5.5	220	4.8	101	3.50		2.25
14	570	5.4	220	4.6	101	3.40		2.30
15	520	6.0	210	4.7	101	3.30		2.50
16	475	6.0	220	4.5	101	3.20		2.45
17	430	6.2	215	4.7	104	3.15		2.55
18	440	5.7	230	4.4	105	3.00		2.60
19	455	5.7	230	4.2	109	2.80		2.65
20	450	5.8	230	4.0	107	2.70		2.60
21	(450)	5.5	240	3.8	107	2.60		2.70
22	---	5.4	250	---	109	2.50		2.70
23	(530)	5.6	245	3.6	109	(2.40)		2.70

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 8

Point Barrow, Alaska (71.3°N, 156.8°W)								June 1957
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.6			---	2.40	4.5	2.80
01		5.5		---	111	2.40	3.2	2.75
02		5.8		---	111	2.30	3.2	2.70
03		5.6		---	---	2.45	4.2	2.60
04		5.6		(3.7)	103	2.40		2.60
05		(5.6)		(4.1)	105	2.60		(2.60)
06		5.4		4.4	101	2.85		(2.40)
07		(5.7)		4.5	100	3.25		(2.35)
08		(6.4)		4.7	101	---		(2.50)
09		(6.5)		---	99	---		(2.55)
10		(6.6)		---	105	---		(2.50)
11		6.2		---	100	3.40		(2.50)
12		6.3		(5.0)	101	3.40		2.55
13		6.3		5.1	103	(3.50)		2.55
14		6.3		5.1	105	(3.50)		2.40
15		6.3		5.0	101	3.45		2.50
16		6.2		4.9	101	(3.30)		2.50
17		6.2		4.8	101	3.15		2.50
18		6.1		(4.4)	101	(3.00)		2.65
19		5.9		---	101	2.80		2.60
20		5.9		---	109	(2.55)		(2.70)
21		5.6		---	109	2.90		2.80
22		5.7			117	2.80	2.8	2.80
23		5.8			121	2.60	2.6	2.85

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 9

Kiruna, Sweden (67.8°N, 20.3°E)								June 1957
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00	---	5.5	360	---	---	---	(3.4)	2.5
01	---	5.9	335	---	---	---	(3.3)	2.45
02	(430)	6.0	(290)	3.5	---	---	(3.0)	2.4
03	(390)	6.1	270	3.8	---	2.0	(2.8)	2.5
04	390	6.0	255	4.0	105	2.4		2.6
05	440	6.2	240	4.4	105	2.8		2.5
06	450	6.6	240	4.6	105	3.0		2.5
07	450	6.4	240	4.8	105	3.1		2.5
08	470	6.7	230	5.0	105	3.2		2.5
09	500	6.9	230	5.1	105	3.4		2.5
10	405	6.8	230	5.2	105	3.5		2.4
11	520	6.8	230	5.3	105	3.5		2.4
12	550	6.4	220	5.3	100	3.5		2.4
13	530	6.3	220	5.3	105	3.5		2.4
14	525	6.2	230	5.2	105	3.4		2.5
15	480	6.2	230	5.1	105	3.3		2.6
16	(475)	6.1	240	5.0	105	3.2		2.6
17	440	6.2	240	4.9	110	3.0	3.1	2.6
18	---	6.4	250	---	110	2.9	(3.3)	2.7
19	---	6.3	250	---	110	2.3	(3.4)	2.7
20	---	6.4	260	---	105	2.1	(3.5)	2.7
21	---	6.2	285	---	---	1.8	(3.3)	2.6
22	---	6.0	310	---	---	---	(3.8)	2.6
23	---	5.9	330	---	---	---	(4.3)	2.5

Time: 15.0°E.

Sweep: 0.8 Mc to 14.0 Mc in 30 seconds.

Table 10

Anchorage, Alaska (61.2°N, 149.9°W)								June 1957
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.3					2.0	2.45
01		5.0			---	---	2.0	2.45
02		5.4			113	---	2.2	2.40
03		5.6		3.2	109	(1.80)	2.4	2.35
04		5.7		3.7	109	2.25		2.35
05		6.1		4.2	109	2.50	2.8	2.35
06		6.2		4.5	109	2.95	3.0	2.30
07		6.4		4.6	107	3.15	3.3	2.30
08		6.4		4.8	103	3.40		2.25
09		6.5		5.0	101	(3.50)	3.5	2.30
10		6.7		5.0	102	3.60	3.6	2.35
11		6.5		5.2	103	(3.65)		2.35
12		6.6		5.2	102	(3.70)		2.30
13		6.4		5.2	102	3.70		2.35
14		6.4		5.3	103	(3.60)		2.35
15		6.2		5.2	107	3.50		2.35
16		6.3		5.0	107	3.40		2.40
17		6.4		5.0	109	3.10		2.50
18		6.4		4.7	111	2.95		2.55
19		6.4		---	112	2.70	3.0	2.60
20		6.2		---	125	(2.25)	3.0	2.70
21		6.2		---	---	---	2.1	2.70
22		5.6		---	---	---	2.6	2.60
23		5.3		---	---	---	2.2	2.55

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 11

Adak, Alaska (51.9°N, 176.6°W)								June 1957
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(7.1)	315					(2.50)
01		(6.8)	330				1.8	(2.45)
02		(6.2)	330					(2.40)
03	---	(5.8)	355		---	---	1.6	2.40
04	450	6.3	300	3.3	119	---	2.2	2.35
05	465	7.0	280	4.0	121	---	2.9	2.30
06	460	7.5	260	4.5	117	---	3.6	2.35
07	430	8.0	250	5.0	111	(3.30)	3.9	2.35
08	420	0.0	<240	5.0	109	(3.55)	4.6	2.40
09	435	8.0	230	5.4	108	(3.70)	5.4	2.45
10	470	7.8	220	5.5	109	(3.80)	5.2	2.40
11	470	7.8	220	5.4	108	(3.90)	4.7	2.45
12	470	7.4	220	5.5	109	(3.90)	5.0	2.45
13	505	7.0	225	5.4	110	(3.90)	4.4	2.40
14	515	6.8	230	5.4	109	(3.85)	4.2	2.40
15	500	6.8	240	5.4	109	(3.70)	4.0	2.40
16	470	6.8	245	5.1	111	3.50	3.7	2.45
17	455	6.8	245	4.9	111	(3.20)	3.8	2.55
18	---	6.8	260	---	113	(2.80)	3.6	2.60
19	---	7.2	280	---	119	(2.35)	3.6	2.70
20	---	7.1	300	---	---	---	3.2	2.70
21	---	7.2	290	---	---	---	3.0	2.60
22	---	7.4	300	---	---	---	(3.2)	2.55
23	---	(7.4)	300	---	---	---	2.2	(2.50)

Time: 180.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 27 seconds.

Table 12

San Francisco, California (37.4°N, 122.2°W)								June 1957
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.4	325				(3.4)	2.40
01		6.3	<325				(3.0)	2.50
02		6.0	<320				(3.0)	2.40
03		5.6	315				(2.8)	2.40
04		5.4	310				(3.0)	2.45
05	---	5.6	300	---	---	---	2.4	2.60
06	---	6.6	255	---	109	(2.55)	3.0	2.50
07	495	7.1	240	4.5	109	(3.15)	3.7	2.40
08	425	8.2	230	4.9	105	(3.50)	4.0	2.50
09	430	8.1	220	5.4	109	(3.70)	4.5	2.40
10	450	8.5	205	5.4	105	(3.90)	4.6	2.40
11	475	8.6	210	5.6	101	(4.00)	4.5	2.40
12	445	9.4	210	5.4	106	>3.90	4.6	2.40
13	420	9.2	215	5.4	109	(4.00)	4.6	2.40
14	415	9.0	<230	5.4	109	(4.00)	4.3	2.45
15	405	8.8	230	5.4	102	(3.80)	4.1	2.50
16	390	8.4	235	5.1	109	(3.65)	3.9	2.55
17	410	8.2	240	4.9	109	3.35	3.5	2.60
18	---	7.8	250	---	109	(2.80)	3.2	2.65
19	---	7.6	275	---	---	---	(3.0)	2.75
20	---	7.4	260	---	---	---	(3.0)	2.65
21	---	7.0	280	---	---	---	(2.8)	2.55
22	---	6.7	300	---	---	---	(3.1)	2.50
23	---	6.4	300	---	---	---	(3.3)	2.50

Time: 120.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 13

White Sands, New Mexico (32.3°N, 106.5°W)

June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.8	<330				(3.4)	2.50
01		6.7	<320				3.0	2.55
02		6.4	<290				2.6	2.60
03		6.0	<285				2.7	2.55
04		5.8	<290				2.7	2.55
05		5.9	<300				2.2	2.60
06	(450)	7.0	250	---	113	2.60	2.8	2.70
07	(455)	8.1	235	4.5	109	3.10	3.6	2.65
08	(450)	8.9	230	4.8	107	3.55	4.4	2.60
09	465	9.5	220	5.2	107	3.80	4.2	2.50
10	430	9.3	210	5.4	107	4.00	4.6	2.45
11	435	9.7	215	5.9	107	4.10	5.2	2.50
12	430	10.1	210	5.9	107	(4.20)	4.6	2.45
13	425	10.0	215	5.9	109	(4.20)	4.7	2.45
14	420	9.8	220	5.7	107	4.10	4.4	2.50
15	405	9.2	<230	5.5	108	4.00	4.2	2.50
16	400	9.0	235	5.2	109	3.65	4.1	2.55
17	400	8.8	240	---	109	3.30	3.7	2.65
18	---	8.2	250	---	111	2.75	3.2	2.70
19		8.1	270	---	---	---	2.8	2.75
20		7.8	<260				(3.6)	2.70
21		7.4	<280				(3.2)	2.60
22		7.0	<310				(3.9)	2.55
23		7.0	<330				(4.6)	2.50

Time: 105.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 14

Formosa, China (25.0°N, 121.5°E)

June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		13.0	300				4.2	2.65
01		(11.8)	280				4.1	(2.7)
02		10.2	260				3.4	2.8
03		9.1	260				2.5	2.7
04		8.5	270				2.7	2.6
05		8.1	270			---	2.5	2.6
06		8.8	240			---	3.5	3.0
07		9.3	230			3.2	4.9	2.9
08		9.5	230			(3.0)	5.8	2.7
09	---	10.3	220	---		(4.0)	6.2	2.5
10	(400)	11.1	220	(6.7)		---	6.2	2.4
11	420	12.2	230	6.5		---	5.4	2.5
12	410	13.1	(230)	6.4		---	<5.5	2.5
13	400	14.0	(220)	6.4		---	5.1	2.5
14	400	14.4	220	6.3		(4.4)	<5.2	2.5
15	390	15.1	220	6.1		(4.2)	<4.8	2.5
16	360	15.5	230	(5.9)		(3.8)	4.4	2.6
17	350	15.0	240	---		3.3	4.2	2.6
18	---	14.2	260			---	4.0	2.6
19		13.8	280				3.4	2.5
20		13.6	310				3.0	2.5
21		13.6	320				2.6	2.4
22		13.2	320				3.0	2.4
23		13.2	320				4.0	2.5

Time: 120.0°E.  
Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 15

Panama Canal Zone (9.4°N, 79.9°W)

June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		9.6	270					2.70
01		9.0	270					2.70
02		8.7	270				(4.3)	2.70
03		8.2	260					2.70
04		7.8	260				(4.6)	2.75
05		7.2	260				(3.4)	2.80
06		7.0	280		---	---	(4.0)	2.80
07		7.7	250		111	2.70	(3.2)	2.95
08	---	8.5	230		109	3.30	(3.9)	2.70
09	---	9.2	225	---	109	3.80	(4.5)	2.40
10	---	10.4	215	---	109	4.00	(4.5)	2.30
11	440	11.2	220	---	111	4.20		2.35
12	415	11.8	220	6.1	109	4.25	4.8	2.40
13	425	12.2	215	6.0	109	4.25	4.7	2.40
14	420	12.4	220	5.8	109	4.20	4.5	2.40
15	415	12.4	225	5.8	109	4.00	4.6	2.45
16	405	11.9	230	5.8	110	3.65	4.2	2.50
17	(400)	11.6	240		110	3.10	(4.0)	2.50
18		11.0	270		119	(2.50)	(3.6)	2.55
19		10.1	290				(2.8)	2.55
20		9.7	310				(2.6)	2.50
21		10.0	315				(2.6)	2.50
22		10.0	305				(3.0)	2.55
23		10.0	295					2.70

Time: 75.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 16

Huancayo, Peru (12.0°S, 75.3°W)

June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		8.4	230					2.90
01		8.2	230					3.05
02		7.7	230					3.05
03		6.8	230					3.05
04		5.6	230					3.10
05		4.9	<250					3.05
06		5.5	275					2.80
07		8.3	260		120	2.50	(5.5)	2.85
08		10.5	240		109	3.20	(6.9)	2.80
09		11.2	230		---	---	(7.8)	2.55
10		11.3	220		---	---	(8.6)	2.40
11		11.1	210		---	---	(9.0)	2.30
12	---	10.8	210	---	---	---	(8.6)	2.25
13	---	10.8	210	---	---	---	(8.6)	2.20
14	---	>10.4	210	---	---	---	(8.6)	2.15
15	---	10.2	220	---	---	---	(8.6)	(2.15)
16		>9.8	240		---	---	>8.0	2.25
17		9.6	270		---	---	>5.9	2.30
18		>9.0	310		---	---	>4.2	2.25
19		8.9	345					2.25
20		8.8	310				(2.8)	2.35
21		>8.8	260				>3.0	2.50
22		8.1	<240				>3.8	2.60
23		8.4	235					2.80

Time: 75.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 17

Resolute Bay, Canada (74.7°N, 94.9°W)

May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00	(350)	6.1	270	---	105	2.1		(2.7)
01	(410)	5.9	270	---	105	2.1		---
02	(380)	5.8	270	3.6	105	2.2		(2.8)
03	400	5.7	260	3.9	100	2.3		(2.7)
04	350	5.8	250	3.9	100	2.5		(2.7)
05	380	5.8	250	4.2	100	2.8		2.7
06	440	5.7	240	4.3	100	2.9		(2.6)
07	470	5.4	230	4.4	100	3.0		(2.3)
08	540	5.4	220	4.6	100	3.2		(2.45)
09	480	5.5	230	4.6	100	3.3		(2.5)
10	520	5.7	220	4.7	100	3.5		(2.3)
11	500	5.9	220	4.8	100	3.4		---
12	520	5.8	220	4.7	100	3.5		---
13	500	5.8	230	4.7	100	3.5		(2.3)
14	520	5.6	230	4.7	100	3.5		G
15	480	5.9	230	4.8	100	3.4		---
16	460	6.0	230	4.8	100	3.2		---
17	450	6.4	230	4.6	100	3.0		(2.4)
18	440	6.2	240	4.4	100	3.0		(2.5)
19	410	6.0	250	4.2	100	2.8		(2.6)
20	380	6.1	270	4.0	100	2.7		---
21	360	6.0	260	4.0	105	2.5		(2.65)
22	320	6.1	270	3.8	105	2.3		(2.5)
23	(320)	6.1	270	---	105	2.1		(2.6)

Time: 90.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 18

Tromsø, Norway (69.7°N, 19.0°E)

May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.9	(345)		---	---	(3.3)	2.35
01	---	5.8	(365)		---	2.40	(3.3)	2.30
02	---	5.6	(315)		---	---	(3.3)	2.30
03	---	5.9	(300)		---	2.30	(3.6)	2.40
04	(445)	6.0	255	4.00	110	2.55	(3.8)	2.40
05	(440)	6.4	255	4.40	110	2.80	3.2	2.55
06	(445)	6.6	250	4.60	110	3.00		2.50
07	460	6.6	245	4.80	105	3.15		2.50
08	445	6.9	245	5.00	105	3.30		2.50
09	460	7.0	240	5.20	110	3.40		2.45
10	460	7.0	240	5.30	105	3.50		2.40
11	470	7.0	235	5.30	105	3.55		2.40
12	475	7.1	240	5.30	105	3.55		2.45
13	460	7.0	235	5.20	105	3.60		2.50
14	445	6.9	240	5.10	110	3.50		2.55
15	460	6.8	245	5.20	105	3.40		2.55
16	(460)	6.8	245	5.00	110	3.30		2.55
17	---	6.7	250	---	110	3.05		2.60
18	---	6.8	260	---	115	2.85		2.70
19	---	6.8	290	---	110	2.90	2.9	2.70
20	---	6.5	295	---	120	2.75		2.60
21	---	6.4	330		135	2.85		2.55
22	---	6.3	345		145	2.55		2.55
23		6.0	(325)		---	---	(3.6)	2.45

Time: 15.0°E.  
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.



Table 19

Kiruna, Sweden (67.0°N, 20.3°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.0	370		---	---	(3.8) 2.5
01		6.0	345		---	---	(4.3) 2.5
02	---	6.0	350	---	---	---	(3.8) 2.5
03	---	6.0	290	3.6	---	2.1	(2.6) 2.6
04	---	6.0	265	4.0	110	2.3	2.6
05	430	6.1	250	4.2	105	2.6	2.6
06	430	6.5	245	4.5	105	3.0	2.6
07	440	6.6	240	4.8	105	3.1	2.6
08	460	6.8	240	5.0	105	3.2	2.6
09	460	6.9	235	5.2	105	3.4	2.5
10	460	7.0	235	5.2	105	3.5	2.5
11	475	7.0	225	5.3	105	3.5	2.5
12	470	7.0	230	5.4	105	3.5	2.5
13	460	7.0	230	5.3	105	3.5	2.6
14	440	7.0	230	5.2	105	3.4	2.6
15	(450)	6.7	230	5.0	110	3.2	2.6
16	(410)	6.9	240	4.9	105	3.0	2.65
17	---	6.8	250	4.5	105	2.9	2.7
18	---	6.6	255	---	110	2.6	2.7
19	---	6.7	260	---	110	2.2	3.1 2.8
20	---	6.3	290	---	---	2.0	2.9 2.7
21	---	6.4	310	---	---	1.8	(2.4) 2.7
22	---	6.1	320	---	---	---	(2.8) 2.6
23	---	6.0	340	---	---	---	(3.6) 2.6

Time: 15.0°E.

Sweep: 0.8 Mc to 14.0 Mc in 30 seconds.

Table 20

Lycksele, Sweden (64.6°N, 18.8°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.1	335		---	---	2.5 2.5
01	---	6.2	335	---	---	E	2.7 2.5
02	---	6.1	325	---	---	E	2.5 2.5
03	340	6.0	290	3.25	115	1.80	2.3 2.6
04	325	6.1	260	3.70	110	2.15	2.7
05	335	6.6	250	4.15	105	2.50	2.7
06	380	6.8	240	4.75	105	2.80	2.6
07	410	7.0	230	4.90	105	3.10	2.6
08	420	7.0	230	5.15	105	3.25	3.9 2.6
09	420	7.3	230	5.30	105	3.35	3.9 2.6
10	420	7.2	220	5.35	100	3.45	4.0 2.6
11	440	7.3	220	5.50	100	3.50	2.6
12	445	7.4	215	5.50	105	3.60	3.8 2.6
13	440	7.5	215	5.45	105	3.55	2.6
14	425	7.4	220	5.45	105	3.50	2.7
15	390	7.2	225	5.40	105	3.40	2.7
16	380	7.2	230	5.10	105	3.20	3.2 2.7
17	360	7.3	240	5.00	105	3.00	3.8 2.8
18	300	7.2	250	4.25	105	2.65	3.6 2.8
19	---	7.1	260	(3.90)	110	2.30	3.1 2.8
20	---	7.0	265	---	130	1.75	2.8 2.8
21	---	7.1	275	---	---	E	2.1 2.7
22	---	7.0	285	---	---	E	2.1 2.7
23	---	6.7	305	---	---	---	2.6

Time: 15.0°E.

Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 21

Baker Lake, Canada (64.3°N, 96.0°W) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.0	280		120	1.3	3.8
01		5.9	270		130	1.3	4.2
02		5.7	290		120	1.5	3.8
03		5.6	280		110	1.8	2.8
04	---	5.4	280	---	110	2.0	2.3
05	(360)	5.3	250	4.0	110	2.4	---
06	410	5.4	230	4.3	110	2.8	5.0
07	450	5.7	220	4.6	105	3.1	5.3
08	500	5.6	210	4.8	100	3.3	4.3
09	490	5.8	210	4.8	100	3.5	5.4
10	500	6.2	220	5.0	100	3.7	6.0 (2.6)
11	500	6.4	230	5.0	100	3.9	5.6 (2.7)
12	480	6.7	220	5.2	100	3.8	2.6
13	470	7.2	220	5.3	100	3.8	5.0 2.6
14	450	7.3	220	5.1	100	3.7	(2.6)
15	440	7.0	220	5.0	100	3.7	(2.6)
16	420	7.0	220	5.0	100	3.5	(2.65)
17	400	7.0	230	4.8	105	3.3	---
18	400	6.7	230	4.6	105	3.0	---
19	(400)	6.8	250	4.2	110	2.6	4.2
20	---	6.0	260	---	115	2.3	5.1
21	---	6.0	280	---	120	2.0	5.0
22	---	6.0	290	---	115	1.8	5.2
23	---	6.0	270	---	140	1.5	4.0

Time: 90.0°W.

Sweep: 1.0 Mc to 16.0 Mc in 16 seconds.

Table 22

Churchill, Canada (58.8°N, 94.2°W) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		5.5	300		130	(1.5)	5.0
01		5.8	300		110	E	5.0
02		5.5	300		120	1.2	5.0
03		5.0	300		130	1.4	5.0
04	---	5.2	320	---	120	2.0	5.0
05	(400)	5.2	300	4.0	120	2.8	4.6
06	450	5.4	280	4.2	110	3.1	4.6 (2.5)
07	500	5.8	260	4.6	105	3.5	2.5
08	500	6.0	240	5.0	100	3.7	4.1 2.5
09	500	6.4	240	5.0	100	3.7	2.4
10	500	6.6	230	5.1	100	3.8	2.4
11	500	6.8	230	5.2	100	3.9	2.4
12	490	7.0	230	5.3	100	3.9	2.4
13	480	7.2	230	5.3	100	3.9	2.4
14	460	7.5	230	5.3	100	3.8	2.5
15	450	7.3	230	5.1	100	3.6	2.4
16	420	7.2	240	5.0	105	3.5	3.2 2.5
17	400	7.0	250	4.7	105	3.3	2.5
18	400	6.7	270	4.4	110	3.2	2.6
19	380	6.3	290	4.0	110	3.0	3.2 (2.7)
20	---	5.9	330	---	120	2.9	3.0 (2.6)
21	---	6.1	310	---	120	2.4	5.0
22	---	6.0	310	---	125	1.9	6.0
23	---	5.5	300	---	120	2.0	7.0

Time: 90.0°W.

Sweep: 1.0 Mc to 17.0 Mc in 16 seconds.

Table 23

Winnipeg, Canada (49.9°N, 97.4°W) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		4.9	330		---	---	3.5 (2.7)
01		4.8	340		---	---	3.4 2.55
02		4.8	360		---	---	3.7 2.6
03		4.9	340		---	---	3.3 2.5
04		4.7	330		---	---	3.5 2.6
05	---	5.0	300	---	120	1.9	3.2 2.7
06	370	5.5	250	4.0	110	2.5	2.7
07	420	6.0	230	4.5	105	3.0	2.6
08	480	6.1	220	4.9	105	3.3	2.5
09	500	6.2	210	5.0	100	3.6	2.5
10	500	6.4	210	5.1	100	3.8	2.5
11	510	6.8	200	5.2	100	3.9	2.4
12	520	6.9	210	5.2	100	4.0	2.4
13	530	6.9	220	5.3	100	4.0	2.4
14	500	6.9	220	5.2	100	3.9	2.4
15	490	6.8	220	5.2	100	3.9	2.5
16	480	6.9	220	5.0	105	3.6	2.5
17	400	7.0	240	5.0	105	3.2	2.5
18	380	7.0	250	4.8	110	2.9	2.6
19	310	7.1	270	---	110	2.5	2.6 2.7
20	---	7.0	280	---	120	1.8	2.6 2.7
21	---	7.0	280	---	---	---	2.4 2.8
22	---	6.4	280	---	---	---	4.0 2.7
23	---	5.4	290	---	---	---	2.6 2.7

Time: 90.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 24

Schwarzenburg, Switzerland (46.8°N, 7.3°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		300	7.9		---	---	2.8
01		300	7.6		---	---	2.85
02		300	7.3		---	---	2.8
03		300	7.0		---	---	2.8
04		290	6.8		---	---	2.9
05		270	7.0		---	---	3.1
06		230	7.8	---	100	2.4	3.2
07		230	8.3	210	5.2	100	3.0 3.8
08		280	8.4	210	5.2	100	3.3 4.6
09		300	8.8	200	5.8	100	3.6 4.6
10		310	9.1	200	6.2	100	3.8 4.6
11		350	9.0	200	6.1	100	3.8 2.95
12		350	9.5	200	6.2	100	3.9
13		360	9.4	200	6.3	100	4.0
14		360	9.2	200	6.1	---	---
15		330	9.2	200	6.1	100	3.7
16		310	9.2	200	6.0	100	3.5
17		300	9.0	220	5.6	100	3.3 3.8
18		280	8.6	220	5.2	100	2.8 4.3
19		(270)	(8.4)	---	---	---	3.2
20		250	8.0	---	---	---	2.8 (3.2)
21		240	8.2	---	---	---	3.15
22		270	8.0	---	---	---	3.1
23		280	8.0	---	---	---	2.9

Time: 15.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 25

Ottawa, Canada (45.4°N, 75.9°W)

May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.9	300				<1.6	2.5
01		5.1	320				<1.5	2.4
02		4.9	320				<1.5	2.5
03		4.7	310				<1.5	2.5
04		4.6	300				<1.5	2.6
05		5.2	270		120	2.0		2.8
06	340	5.8	250	---	110	2.7		2.7
07	380	6.1	230	4.9	105	3.1		2.6
08	420	6.4	220	5.0	105	3.4		2.6
09	470	6.7	210	5.3	105	3.8		2.5
10	460	7.0	210	5.4	105	4.0		2.5
11	470	7.2	200	5.6	105	4.0		2.5
12	470	7.1	210	5.7	105	4.0		2.5
13	480	7.4	220	5.6	105	4.0		2.5
14	470	7.4	220	5.7	105	4.0		2.5
15	450	7.5	230	5.4	105	3.8		2.5
16	420	7.7	230	5.3	105	3.6		2.6
17	370	7.8	240	5.0	110	3.1		2.6
18	320	8.0	260		110	2.7		2.6
19	---	8.3	280		125	2.0	2.1	2.6
20		8.2	270				<1.6	2.6
21		7.6	270				<1.5	2.6
22		7.0	280				<1.5	2.6
23		6.5	290				<1.5	2.5

Time: 75.0°W.

Sweep: 1.0 Mc to 20.0 Mc in 15 seconds.

Table 26

Wakkanai, Japan (45.4°N, 141.7°E)

May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		8.5	290				2.1	2.60
01		8.2	280				1.6	2.60
02		7.8	280					2.60
03		7.5	280					2.55
04	---	7.6	295					2.60
05	---	8.0	255				2.3	2.70
06	(350)	8.3	240				3.4	2.65
07	340	8.8	240				3.5	2.70
08	375	8.6	250				4.1	2.70
09	415	8.9	250				4.2	2.60
10	400	9.0	250				4.2	2.60
11	390	9.2	240				4.0	2.60
12	400	9.6	250					2.60
13	380	9.4	250					2.60
14	365	9.3	260				3.5	2.65
15	350	9.0	250				4.0	2.65
16	350	8.8	245				4.0	2.75
17	(335)	8.5	250				3.5	2.75
18	---	8.4	260				(3.6)	2.75
19		8.6	270				(3.2)	2.70
20		8.5	275				2.3	2.60
21		8.5	290				2.3	2.55
22		8.5	300				2.0	2.55
23		8.7	300				2.3	2.60

Time: 135.0°E.

Sweep: 1.0 Mc to 22.0 Mc in 1 minute.

Table 27

Akita, Japan (39.7°N, 140.1°E)

May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		9.0	300				(2.8)	2.60
01		8.8	295				(1.8)	2.65
02		8.2	290				(2.2)	2.60
03		7.9	290				(2.3)	2.60
04		7.6	300				(2.0)	2.50
05	---	8.4	255				(2.5)	2.75
06	(250)	9.4	245				3.5	2.85
07	(250)	9.8	245				4.0	2.75
08	250	9.7	245				4.4	2.70
09	250	10.1	240				4.6	2.60
10	(250)	10.5	230				4.5	2.60
11	250	10.8	230				4.4	2.60
12	(250)	10.8	230				4.6	2.60
13	(255)	10.6	230				4.5	2.60
14	---	10.6	240				4.5	2.60
15	---	10.5	245				4.3	2.65
16	(255)	9.6	250				4.3	2.70
17	---	9.4	260				(4.0)	2.70
18	---	9.5	270				(3.5)	2.80
19		9.0	280				(3.0)	2.70
20		8.7	300				(2.5)	2.60
21		9.0	310				(2.5)	2.55
22		9.0	320				(3.0)	2.55
23		9.0	310				(2.5)	2.55

Time: 135.0°E.

Sweep: 0.85 Mc to 22.0 Mc in 2 minutes.

Table 28

Tokyo, Japan (35.7°N, 139.5°E)

May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		9.6	305				2.4	2.60
01		9.5	300				2.2	2.65
02		8.9	290				(2.6)	2.65
03		8.5	290				(2.2)	2.55
04		8.0	305				2.4	2.50
05		9.0	260			2.00	2.4	2.70
06	(280)	9.8	250	---		2.80	3.7	2.80
07	265	10.2	250	---		3.30	4.3	2.70
08	270	10.4	240	---		3.70	4.7	2.60
09	275	10.3	240	---		3.85	4.7	2.55
10	280	11.0	240	---		4.00	4.8	2.50
11	300	11.6	230	---		4.10	4.6	2.55
12	350	12.0	250	5.8		4.10	4.8	2.55
13	365	12.2	245	6.0		4.10	4.7	2.55
14	355	12.2	245	5.8		3.90	4.5	2.60
15	350	11.8	250	5.7		3.70	4.4	2.60
16	320	11.0	255	---		3.45	4.5	2.65
17	290	10.4	260			2.90	4.2	2.65
18	---	10.1	280			2.30	(3.5)	2.70
19		9.8	280				(2.6)	2.65
20		9.4	305				(2.9)	2.50
21		9.4	330				3.2	2.45
22		9.6	330				(2.5)	2.45
23		9.8	320				(2.5)	2.55

Time: 135.0°E.

Sweep: 1.0 Mc to 17.2 Mc in 2 minutes.

Table 29

Yamagawa, Japan (31.2°N, 130.6°E)

May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		11.3	300				(2.8)	2.70
01		11.0	290				(2.6)	2.80
02		10.1	255				(2.6)	2.80
03		9.0	270				(2.6)	2.70
04		8.4	290				(2.6)	2.60
05		8.2	295				(2.3)	2.60
06		9.3	250				2.6	2.90
07		10.0	245				3.8	2.90
08	---	10.2	245				4.6	2.75
09	---	10.6	<245				5.3	2.60
10	(250)	11.0	235				5.2	2.50
11	(250)	12.1	235				(5.3)	2.55
12	(250)	12.7	240				5.2	2.55
13	---	13.0	240				4.9	2.55
14	(265)	13.5	<250				5.1	2.60
15	(275)	13.0	245				5.1	2.65
16	(285)	12.6	250				(5.3)	2.60
17		11.8	250				(5.6)	2.65
18		11.7	285				(5.5)	2.65
19		11.3	290				(4.4)	2.70
20		10.5	300				(4.2)	2.60
21		10.5	310				(3.5)	2.50
22		10.9	330				(3.6)	2.50
23		11.0	320				(3.0)	2.60

Time: 135.0°E.

Sweep: 1.0 Mc to 20.0 Mc in 1 minute.

Table 30

Formosa, China (25.0°N, 121.5°E)

May 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		280	(15.6)				3.1	2.8
01		260	14.2				3.3	2.9
02		240	12.4				2.8	2.9
03		240	11.2				2.8	2.8
04		250	10.0				2.7	2.8
05		260	8.9				2.9	2.8
06		240	9.5		140	2.2	3.5	2.9
07		240	10.1	---	120	3.1	4.4	2.9
08		230	11.0	220	---	110	3.6	5.4
09		---	11.9	220	---	100	3.8	6.0
10		---	12.8	220	---	100	4.0	5.8
11	(360)	14.0	---	(7.0)	---	---	5.7	2.5
12	(400)	15.0	---	6.8	---	---	5.6	2.5
13	(410)	15.7	---	(6.6)	---	---	---	2.6
14	380	16.2	220	(6.6)	---	---	5.2	2.6
15	380	16.2	220	6.3	100	3.9	4.5	2.6
16	---	16.6	240	---	110	3.7	4.2	2.6
17	---	16.4	240	---	---	---	4.1	2.6
18	270	16.4	---	---	---	---	3.6	2.7
19	300	16.5					3.1	2.6
20	320	16.5					2.9	2.5
21	320	16.3					3.1	2.6
22	300	16.5					2.7	2.6
23	290	16.1					2.9	2.7

Time: 120.0°E.

Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

**Table 31**

Baguio, P.I. (16.4°N, 120.6°E) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		13.6	265					3.00
01		11.5	240					3.05
02		9.6	230					2.90
03		8.9	245				1.4	2.75
04		8.0	245				1.6	2.85
05		6.9	240				2.2	2.80
06		8.5	275		130	(2.15)	(4.2)	2.85
07		10.0	250		119	(3.00)	(5.4)	2.80
08		11.1	250		117	(3.50)	(5.6)	2.50
09		11.8	240		115	(3.85)	(6.0)	2.30
10		12.4	230		117	4.00	5.0	2.20
11		12.7	225		119	4.10		2.15
12		13.0	220		117	(4.15)		2.15
13		13.0	220		119	4.10		2.10
14		13.0	220		118	4.00	4.2	2.10
15		12.8	230		117	3.80	4.1	2.10
16	---	13.0	245		119	(3.40)	4.0	2.20
17		13.0	265		119	(2.80)	(3.9)	2.25
18		12.8	295		135	2.00	(3.1)	2.30
19		>12.0	375				2.0	2.20
20		12.0	400				2.0	2.15
21		12.2	375				2.4	2.30
22		12.7	325					2.50
23		13.2	300					2.80

Time: 120.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

**Table 32**

Nairobi, Kenya (1.3°S, 36.8°E) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		---	---					---
01		---	(220)					---
02		>11.6	(210)				>2.4	---
03		>10.8	220				>2.0	---
04		>9.2	220				2.6	---
05		>8.0	220				2.6	---
06		>7.0	220				>2.6	(3.15)
07		---	(240)					---
08	(260)	(13.2)	240	---		3.1	4.1	(3.1)
09	260	(13.4)	240	---		---	---	(3.0)
10	---	>13.2	---	---		---	---	2.8
11	---	>13.8	---	---		---	---	2.7
12	(410)	14.4	---	---		---	5.6	(2.5)
13	---	---	---	---		---	---	---
14	---	---	---	---		---	---	---
15	(420)	15.0	---	---		---	(5.0)	(2.4)
16	(410)	>15.1	250	---		---	---	2.3
17	---	>15.0	250	---		3.1	3.2	(2.3)
18	---	---	---	---		---	---	---
19	---	---	---	---		---	---	---
20	---	---	---	---		---	---	---
21	---	---	---	---		---	---	---
22	---	---	---	---		---	---	---
23	---	---	---	---		---	---	---

Time: 45.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 7 seconds.

**Table 33**

Leopoldville, Belgian Congo (4.4°S, 15.2°E) May 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	215	13.4						2.74
01	220	11.0						2.73
02	230	8.1					2.2	2.72
03	240	6.3					2.2	2.58
04	250	5.0					2.9	2.54
05	270	6.6			---	---	2.5	2.66
06	255	10.4	250	---	120	2.8	3.5	2.78
07	270	12.9	240	---	115	3.4	4.1	2.73
08	290	13.6	235	---	115	3.9	4.1	2.66
09	320	13.6	230	---	115	4.0		2.50
10	345	14.0	230	---	115	4.1		2.43
11	380	14.4	220	---	110	4.1		2.31
12	385	15.0	215	---	110	4.1		2.26
13	400	15.8	235	---	115	4.0		2.18
14	400	15.5	245	---	115	3.6		2.18
15	380	15.8	245	---	115	3.2	3.6	2.20
16	340	16.0	260	---	120	2.6	3.6	2.25
17	300	16.1	280	---			3.4	2.34
18	290	16.5					2.6	2.40
19	295	17.0					2.3	2.35
20	245	17.5						2.54
21	230	18.1						2.63
22	225	18.1						2.70
23	220	16.0						2.67

Time: 0.0°.

Sweep: 1.0 Mc to 20.0 Mc in 7 seconds.

**Table 34**

Talara, Peru (4.6°S, 81.3°W) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		10.4	230					2.75
01		10.7	240					2.95
02		10.2	240					3.00
03		9.0	230					3.10
04		7.4	230					3.10
05		5.4	<235					3.00
06		5.4	255					2.85
07		8.1	270		128	2.30		2.85
08		10.2	245		117	3.10	3.4	2.75
09	---	11.2	235		113	3.60		2.50
10	---	11.2	225		111	3.90		2.35
11	---	11.6	220		112	4.00		2.20
12	---	11.7	215		111	4.10		2.15
13	---	11.8	210		113	4.05	4.2	2.20
14	---	12.1	215		113	3.95		2.20
15	---	12.0	215		111	3.70		2.15
16	---	11.8	230		113	3.30	3.6	2.15
17	---	11.5	250		121	2.85	3.2	2.15
18		(11.2)	290		---	---	>2.8	(2.10)
19		(10.8)	380				>3.1	(2.10)
20		11.0	380				(2.5)	(2.10)
21		(11.6)	<330				>3.1	(2.40)
22		(11.5)	270				>3.1	(2.60)
23		10.7	230				>2.5	(2.70)

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

**Table 35**

Elisabethville, Belgian Congo (11.6°S, 27.5°E) May 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	235	7.1						2.67
01	225	5.5						2.56
02	235	4.5						2.65
03	240	3.6					1.6	2.67
04	250	4.6						2.40
05	240	9.4			120	2.4	3.0	2.92
06	245	11.3	235	---	110	3.2	3.4	2.82
07	250	12.8	225	---	100	3.6	3.8	2.71
08	260	13.2	220	---	105	3.9	3.9	2.60
09	285	13.3	235	---	105	4.0		2.52
10	(320)	13.5	235	---	105	4.0		2.41
11	330	13.2	235	---	105	3.9	4.6	2.37
12	350	13.5	235	---	105	3.6	4.8	2.35
13	340	13.5	235	---	105	3.4	4.2	2.34
14	315	13.7	240	---	110	3.4		2.38
15	265	13.5	255	---	115	2.7	4.4	2.45
16	250	13.5			---	---	3.8	2.52
17	240	13.4					3.2	2.60
18	240	12.4					3.4	2.64
19	230	12.3					3.0	2.58
20	225	13.5					2.0	2.71
21	220	12.0						2.62
22	225	10.0						2.56
23	230	8.6						2.45

Time: 0.0°.

Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

**Table 36**

Huancayo, Peru (12.0°S, 75.3°W) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		8.1	230					2.95
01		7.8	230					3.00
02		7.4	230					3.05
03		6.5	235					3.05
04		5.3	235					3.10
05		4.7	235					3.15
06		5.2	260					2.90
07		9.0	255		119	2.45	(4.8)	3.00
08		11.3	235		111	3.20	(7.5)	2.80
09		12.2	225		---	---	>8.6	2.55
10		12.2	215		---	---	(11.1)	2.35
11		11.6	215		---	---	(11.6)	2.25
12	---	11.6	205		---	---	(11.1)	2.20
13		11.4	200		---	---	(9.9)	2.20
14		11.2	200		---	---	>8.8	2.20
15		11.1	215		---	---	(7.8)	2.20
16		10.9	240		---	---	>5.8	2.20
17		10.5	265		---	---		2.20
18		>9.4	320					2.20
19		9.0	380					2.15
20		(8.7)	340				(2.5)	(2.25)
21		8.6	280					2.40
22		8.1	240					2.60
23		8.1	235					2.80

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 37

Townsville, Australia (19.3°S, 146.7°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		>6.0	240				(3.00)
01		>6.2	240				3.00
02		5.5	240				3.00
03		4.8	240				3.10
04		>4.0	250				2.90
05		4.2	260				2.90
06		4.8	250				3.05
07		>7.5	230			2.20	----
08		>10.5	230			3.00	3.1
09	---	>11.0	220			3.40	----
10	(240)	(13.0)	210			3.60	4.0 (3.10)
11	---	>12.0	200			3.75	4.3
12	---	12.0	210			3.80	4.5
13	---	12.5	220			3.75	4.5
14		11.8	210			3.70	4.5
15		11.8	230			3.50	4.3 (2.80)
16		>10.5	240			3.10	3.8
17		>8.0	240			2.50	4.1
18		>7.2	240			----	>4.0
19		>6.7	230				3.1
20		>7.0	230				2.7
21		>6.5	240				----
22		>6.5	230				----
23		>6.5	230				(2.80)

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 38

Johannesburg, Union of S. Africa (26.2°S, 28.0°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		3.7	<290				2.8
01		3.8	<280				2.8
02		3.7	<290				2.8
03		3.8	<260				2.9
04		3.6	<250				2.9
05		3.4	(250)				2.9
06		3.6	240				2.9
07		7.8	230			2.2	3.2
08	---	10.8	230			2.9	3.3
09	240	12.4	230			3.3	3.2
10	240	13.2	220			3.6	3.1
11	240	13.7	220	---		3.8	2.9
12	(250)	13.2	210	---		(3.9)	2.9
13	(290)	13.1	220	---		3.8	4.0 2.8
14	(300)	13.4	230	---		(3.7)	3.9 2.8
15	---	13.2	240	---		3.5	3.6 2.8
16	---	13.0	240			3.0	2.8
17		12.8	240			2.3	2.9
18		11.9	220				2.9
19		10.0	220				3.0
20		8.8	230				3.1
21		6.8	230				3.2
22		4.9	230				3.1
23		4.0	240				2.85

Time: 30.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

Table 39

Brisbane, Australia (27.5°S, 152.9°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		6.0	250				2.70
01		5.9	250				2.70
02		5.6	250				2.65
03		5.5	255				1.5 2.70
04		5.0	250				2.5 2.65
05		5.0	260			E	2.70
06		6.0	250			E	2.80
07		9.6	240			2.45	3.15
08		11.4	230			3.00	3.15
09		12.6	230			3.45	3.10
10		12.8	220			3.60	3.9 3.05
11		12.0	220			3.80	4.0 2.90
12		12.0	220			3.80	4.2 2.85
13		11.7	220			3.80	2.80
14		11.7	230			3.60	3.6 2.80
15		11.4	240			3.25	3.6 2.80
16		>11.0	235			2.60	3.1 2.80
17		10.9	240			1.90	2.80
18		9.5	230			E	2.9 2.75
19		8.6	230			----	2.80
20		8.2	240				2.75
21		7.4	240				2.75
22		6.8	245				2.75
23		6.4	250				2.70

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 40

Capetown, Union of S. Africa (34.1°S, 18.3°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		3.2	<300				2.7
01		3.1	<310				2.6
02		3.4	<320				2.6
03		3.4	<320				2.65
04		3.6	<300				2.8
05		3.4	260				2.9
06		3.2	<260				2.9
07		3.9	240				2.8
08		7.8	230			2.2	3.3
09		10.4	230			2.9	(3.25)
10		250	>11.9	230	---		----
11		240	>12.8	230	---		----
12		240	>12.6	230	---		----
13		(250)	>13.1	230	---		(3.7)
14		(260)	>13.1	240			3.7
15		250	>13.0	240			3.4
16		---	>13.0	240			3.1
17			>12.8	240		2.6	----
18			>12.2	220			----
19			>10.8	220			----
20			(9.2)	220			(2.95)
21			6.6	220			(3.1)
22			4.0	230			3.3
23			3.0	(240)			3.3

Time: 30.0°E.

Sweep: 1.0 Mc to 14.0 Mc in 7 seconds.

Table 41

Scott Base (77.8°S, 166.8°E) May 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		3.1	300		---	---	----
01		3.0	300		---	---	----
02		(3.2)	300		---	---	----
03		(3.4)	<300		---	---	----
04		---	290		---	---	----
05		(4.1)	280		---	---	----
06		4.4	250		---	---	----
07		3.8	250		---	---	----
08		4.3	250		---	---	----
09		(5.2)	250		---	---	----
10		(6.0)	240		---	---	----
11		6.6	240		---	---	----
12		6.8	250		---	---	----
13		7.0	250		---	---	4.7 (3.10)
14		7.3	250		---	---	2.8
15		8.0	250		---	---	2.3
16		8.3	250		---	---	(3.05)
17		8.6	250		---	---	----
18		9.0	250		---	---	----
19		7.8	250		---	---	----
20		6.9	260		---	---	----
21		(5.8)	250		---	---	----
22		4.9	260		---	---	----
23		(3.8)	290		---	---	----

Time: 165.0°E.

Table 42

Resolute Bay, Canada (74.7°N, 94.9°W) April 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs (M3000)F2
00		6.4	280		---	1.7	1.7 2.7
01		6.8	280		---	1.7	1.7 (2.85)
02		6.4	270		110	1.8	1.8 (2.6)
03		6.2	280	---	120	2.0	2.7
04		(310)	6.2	280	---	110	2.1 2.75
05		320	6.3	280	---	105	2.3 2.7
06		330	6.0	260	3.9	105	2.6 2.75
07		400	5.8	250	4.1	100	2.8
08		400	6.0	250	4.2	100	3.0 (2.5)
09		460	5.9	240	4.4	100	3.0 2.5
10		480	6.0	250	4.5	100	3.2 2.5
11		500	5.8	240	4.6	100	3.2 2.45
12		450	5.8	250	4.6	100	3.2 (2.6)
13		460	6.8	240	4.7	100	3.2 (2.6)
14		460	6.0	250	4.7	100	3.2 (2.45)
15		440	5.7	250	4.5	100	3.1 (2.65)
16		420	6.1	250	4.4	100	3.0 2.45
17		400	6.4	250	4.2	105	2.9 (2.7)
18		440	6.6	260	4.0	105	2.7 2.5
19		330	6.2	280	3.5	105	2.5 2.6
20		(380)	6.3	290	---	105	2.3 2.6
21			6.0	280		105	2.0 2.6
22			6.0	280		---	1.9 <2.5 (2.7)
23			6.3	280		110	1.8 1.8 2.6

Time: 90.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.



Table 43

Godhavn, Greenland (69.2°N, 53.5°W)							April 1957	
Time	h'F2	foF2	h'F	fof1	h'E	foE	foEs	(M3000)F2
00		(6.6)						(2.60)
01		(5.1)						(2.60)
02		(4.9)						(2.45)
03		(4.8)						2.60
04		(4.9)						(2.65)
05		(4.5)		---	---	----		----
06		5.0		---	113	(2.40)		2.75
07		(4.8)		---	111	2.55		(2.80)
08		(5.4)		(4.0)	111	(2.90)		----
09		(6.6)		4.3	111	3.20		(2.40)
10		(6.8)		4.6	111	(3.30)		(2.55)
11		(7.2)		4.7	111	(3.30)		(2.50)
12		(7.0)		4.7	112	(3.40)		(2.45)
13		(6.9)		4.7	110	3.30		(2.50)
14		(6.4)		4.7	111	(3.30)		(2.50)
15		(6.4)		4.8	111	3.20		(2.45)
16		(6.4)		4.5	113	3.00		(2.60)
17		(6.2)		4.5	111	2.90		2.55
18		(6.4)		(4.2)	113	2.70		2.60
19		(6.2)		---	117	2.35		2.65
20		(6.5)		---	<121	2.00		2.60
21		(6.3)			129	----		(2.55)
22		(6.4)						(2.60)
23		(6.4)						(2.60)

Time: 45.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 44

Churchill, Canada (58.8°N, 94.2°W)							April 1957	
Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		6.0	310		---	---	5.0	(2.4)
01		5.8	310		---	1.4	4.0	(2.5)
02		5.5	300		115	(1.8)	4.0	---
03		4.6	360		120	2.0	3.8	---
04		5.0	360		120	2.0	3.8	---
05		5.0	350		120	2.5		(2.6)
06	(490)	5.4	300	---	120	3.0		(2.8)
07	490	6.1	290	4.3	115	3.1		(2.7)
08	500	6.0	260	5.0	110	3.3		(2.7)
09	510	6.2	260	4.9	110	3.6		2.4
10	520	6.3	250	5.0	110	3.6		2.45
11	500	6.4	230	5.0	110	3.8		2.45
12	490	7.0	240	5.1	110	3.8		2.4
13	490	7.2	240	5.1	110	3.7		2.3
14	480	7.4	240	5.0	110	3.7		2.4
15	460	7.4	240	5.0	110	3.5		2.4
16	410	7.0	240	4.7	110	3.3		2.5
17	400	6.5	270	4.4	115	3.0		2.5
18	(410)	6.5	300	4.2	115	3.0		(2.6)
19	---	6.2	330	---	125	2.8		(2.6)
20		5.6	320		125	2.6	2.8	(2.5)
21		5.5	320		120	2.2	5.0	---
22		5.5	300		135	2.0	5.0	---
23		6.0	310		---	---	5.0	---

Time: 90.0°W.  
Sweep: 1.0 Mc to 17.0 Mc in 16 seconds.

Table 45

Leopoldville, Belgian Congo (4.4°S, 15.2°E)								April 1957
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	220	14.6						2.71
01	215	12.0						2.67
02	230	11.0						2.67
03	230	8.4						2.70
04	230	5.6					2.0	2.69
05	255	6.3	---	---	---	---	2.6	2.60
06	250	10.2	245	---	120	2.8	3.4	2.72
07	275	12.2	240	---	115	3.5	4.0	2.60
08	295	13.4	230	---	110	3.8	4.8	2.53
09	(350)	13.9	220	---	110	4.0	4.7	2.38
10	385	14.8	220	---	110	4.1		2.30
11	380	15.9	230	---	115	4.1		2.32
12	390	16.0	230	---	110	4.2		2.26
13	410	16.0	230	---	110	4.0		2.19
14	420	16.0	240	---	115	3.9	4.6	2.17
15	395	16.2	245	---	115	3.3	4.0	2.20
16	380	16.4	260	---	120	2.7	3.9	2.22
17	325	16.7	290	---	---	---	3.4	2.26
18	320	17.1					3.0	2.25
19	300	>17.6						<2.37
20	245	>17.6						<2.50
21	230	>17.7						2.52
22	230	18.3						2.57
23	230	17.5						2.68

Time: 0.0°.  
Sweep: 1.0 Mc to 20.0 Mc in 7 seconds.

Table 46

Talara, Peru (4.6°S, 81.3°W)							April 1957	
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		10.5	220				>3.8	2.75
01		>10.4	235					2.75
02		10.2	250					2.90
03		9.1	240				>1.9	2.85
04		8.5	235				1.8	2.90
05		7.2	240				(1.7)	2.95
06		6.9	245			E	1.8	2.90
07		9.4	265		129	2.25	2.5	2.90
08		11.7	245		119	3.20	3.5	2.80
09		12.8	230		115	3.70		2.60
10		13.4	225		113	4.00		2.40
11		>13.5	220		113	4.15		2.40
12		(13.5)	215		113	4.20		2.30
13		(13.5)	215		113	4.20		(2.20)
14		(13.6)	215		111	4.05		(2.20)
15		13.5	215		110	3.80		2.30
16		13.4	230		111	3.35		2.30
17		>13.0	250		116	2.90		(2.20)
18		>13.0	285		---	---	2.3	(2.10)
19		>11.5	370				>3.2	---
20		>11.5	385				>2.9	---
21		>12.4	320				>3.1	(2.30)
22		>12.3	250				(4.4)	(2.60)
23		(11.7)	220				>4.4	(2.80)

Time: 75.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 47

Elisabethville, Belgian Congo (11.6°S, 27.5°E)								April 1957
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	230	8.0						2.57
01	240	6.8						2.62
02	245	5.1						2.63
03	245	4.0					2.4	2.76
04	245	4.8					2.2	2.49
05	235	9.2	---	---	120	2.4	3.0	2.84
06	240	11.4	230	---	110	3.2	3.6	2.76
07	250	12.7	230	---	110	3.6	3.8	2.63
08	270	13.4	225	---	110	3.8	4.0	2.51
09	---	13.6	230	---	110	4.0		2.43
10	340	14.1	235	---	110	4.0		2.39
11	350	14.2	230	---	110	4.0	4.5	2.37
12	365	14.1	240	---	110	4.0	4.7	2.33
13	355	14.0	240	---	110	3.7	4.6	2.34
14	340	13.7	245	---	115	3.4	4.4	2.34
15	280	13.6	255	---	115	2.8	4.0	2.38
16	265	13.6	---	---	---	---	3.2	2.47
17	260	>13.5					3.0	2.52
18	250	>13.4					2.8	2.58
19	235	13.6					2.3	2.59
20	230	>13.3						2.59
21	230	13.1						2.64
22	225	10.8						2.67
23	240	9.4						2.56

Time: 0.0°.  
Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

Table 48

Huancayo, Peru (12.0°S, 75.3°W)								April 1957
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		9.0	230					2.90
01		8.5	230					3.00
02		7.8	240				(3.7)	2.95
03		7.0	250				(2.9)	2.90
04		6.5	245					3.00
05		6.0	240					3.05
06		6.6	260					2.90
07		10.4	250		121	2.60	(5.2)	3.00
08		13.0	235		119	(3.25)	(7.3)	2.85
09		14.1	225			3.60	(8.7)	2.55
10		>14.5	215				(11.2)	2.35
11		14.4	210				(11.6)	2.25
12		13.4	210				(11.6)	2.20
13		12.9	210				(11.6)	2.15
14		13.0	210				(10.7)	2.15
15		13.0	210				(8.6)	2.10
16		12.8	240				(8.2)	2.10
17		>12.6	265				>6.8	2.10
18		(11.2)	310					(2.15)
19		9.2	410					(2.05)
20		(9.1)	390					(2.30)
21		(9.2)	280					(2.45)
22		9.2	240					2.70
23		9.0	230				(4.3)	2.85

Time: 75.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.



Table 49

Townsley, Australia (19.3°S, 146.7°E)							
April 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		>7.5	250				----
01		>7.5	250				(2.80)
02		>7.4	260				(2.85)
03		>7.0	240				3.00
04		6.4	230			1.6	2.80
05		6.2	280			2.8	2.70
06		>6.5	250			2.6	2.95
07		>8.0	230			2.45	
08		(12.8)	225			3.05	(3.10)
09	---	(14.0)	220			3.50	(3.20)
10	---	14.0	220			3.70	4.0
11	---	13.8	210			3.80	4.2
12	---	>13.1	210			3.90	4.3
13	---	13.5	210	---		3.90	4.1
14		14.0	220			3.80	4.3
15		(13.5)	230			3.65	4.2
16		>12.0	240			3.30	4.1
17		>9.5	245			2.70	3.8
18		>8.0	250			----	3.6
19		>7.5	250				3.1
20		>7.6	250				2.8
21		>8.0	250				
22		>7.5	250				
23		>7.5	240				----

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 50

Rarotonga I. (21.2°S, 159.6°W)							
April 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		(10.2)	250				(2.8)
01		(9.5)	250				(2.7)
02		8.7	250				2.7
03		(7.8)	250				2.8
04		6.7	280				2.65
05		6.6	300				2.7
06		8.0	300				2.8
07		(12.7)	250			2.5	(3.0)
08		14.2	250		105	3.2	3.1
09		14.4	250		110	3.5	3.0
10	---	15.2	240		110	3.8	2.9
11	---	14.7	240	---	110	---	3.9
12	(360)	15.0	250	---	110	(4.2)	2.7
13	360	15.5	250	7.5	110	(4.2)	2.7
14	360	15.5	250	---	110	(3.8)	4.6
15	(350)	14.8	250	---	---	3.5	4.5
16	---	(14.7)	250	---	---	3.2	4.4
17		(14.5)	260	---	---	---	3.9
18		(14.1)	300				3.4
19		(14.2)	290				3.4
20		(14.0)	<260				2.2
21		(13.1)	260				2.0
22		(12.7)	250				(2.8)
23		(11.0)	250				(2.8)

Time: 165.0°W.

Sweep: 1.5 Mc to 20.0 Mc in 5 minutes, manual operation.

Table 51

Brisbane, Australia (27.5°S, 152.9°E)							
April 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		7.4	280				2.55
01		7.4	290				2.50
02		7.2	290			2.7	2.60
03		6.8	260				2.65
04		6.5	250				2.50
05		6.4	260				2.55
06		7.5	250			E	2.80
07		10.9	240			<2.70	3.00
08		>12.4	230			3.25	3.05
09		>13.0	230			3.55	3.8
10		>13.2	230			>3.80	4.0
11		12.8	220			3.95	4.3
12		12.9	220			3.95	4.0
13		12.8	220			3.95	4.1
14		12.5	230			3.80	3.9
15		12.2	240			3.50	3.7
16		11.7	240			3.00	3.4
17		11.4	240			2.20	3.0
18		10.9	240			E	2.9
19		9.5	250			----	3.0
20		9.3	270				2.80
21		8.9	250				3.2
22		8.1	260				2.7
23		7.8	270				3.1

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 52

Scott Base (77.8°S, 166.8°E)							
April 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		(3.5)	330				
01		3.6	340				----
02		(3.5)	340				
03		4.1	340				----
04		(3.8)	300				
05		3.7	300				----
06		4.4	300				----
07		4.0	280			E	
08		6.2	250			<1.3	
09		5.8	270			<1.4	
10		6.8	250			1.8	2.3
11		7.4	250			<2.0	
12		7.8	260			---	
13		8.3	270			1.8	(3.00)
14		9.0	260			130	---
15		8.0	280			150	1.6
16		9.0	270			E	---
17		9.0	260				(3.00)
18		8.4	260				----
19		7.6	290				----
20		7.4	290				----
21		5.8	300				----
22		5.5	300				----
23		4.3	330				----

Time: 165.0°E.

Table 53

Godhavn, Greenland (69.2°N, 53.5°W)							
March 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		5.5	280				2.60
01		(5.7)	270				2.65
02		(5.0)	280				(2.70)
03		(4.1)	295				(2.50)
04		(4.0)	290				2.50
05		(4.2)	295				----
06		4.6	300			1.8	(2.75)
07	----	(4.6)	280			----	(2.80)
08	----	(5.6)	255		121	2.30	(2.80)
09	----	(6.4)	250	(3.7)	119	2.50	2.75
10	----	(7.0)	260	(4.2)	118	2.80	2.80
11	(3.55)	6.9	250	4.4	115	(2.95)	2.70
12	(4.40)	(7.8)	240	(4.4)	115	3.00	(2.55)
13	3.90	(7.4)	235	4.3	115	3.00	(2.75)
14	(4.10)	7.3	245	(4.3)	117	2.85	2.60
15	(4.40)	6.8	245	4.2	117	2.70	2.70
16	----	6.7	250	(4.4)	119	2.55	2.70
17	----	(7.0)	260	----	119	2.35	2.65
18	----	6.8	265	----	121	2.00	2.70
19	----	(6.6)	<270	----	----	1.7	2.60
20		6.7	270				2.55
21		(6.0)	255				(2.60)
22		5.8	275				2.60
23		5.2	270				2.60

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 54\*

Slough, England (51.5°N, 0.6°W)							
March 1957							
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00		330	5.9				2.1
01		330	5.5				2.35
02		335	5.2				2.4
03		325	4.7				2.1
04		320	4.1				2.2
05		310	3.7				2.3
06		285	4.9			1.7	2.9
07		265	7.0	(260)	(4.4)	125	2.2
08		265	8.5	250	4.7	120	2.7
09		275	10.2	235	5.0	115	3.1
10		275	11.4	230	4.9	120	3.3
11		275	12.6	235	5.4	115	3.5
12		250	12.3	230	5.5	115	3.5
13		270	12.1	235	5.3	115	3.6
14		265	11.8	235	5.3	115	3.4
15		260	11.6	245	5.1	115	3.3
16		250	11.8	(255)	(5.0)	120	2.9
17		255	11.3	(250)	(5.0)	125	2.4
18		250	10.6			145	1.8
19		240	9.5				2.1
20		250	8.1				1.9
21		280	7.0				2.5
22		315	6.5				1.8
23		330	6.1				2.2

Time: 0.0°.

Sweep: 0.55 Mc to 16.5 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 55

Talara, Peru (4.6°S, 81.3°W)							
March 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		11.6	220				(3.2) 2.80
01		10.8	230				(3.5) 2.90
02		9.6	240				(4.0) 2.95
03		8.6	240				(3.0) 3.00
04		7.4	230				(2.6) 3.05
05		6.4	230				(2.0) 3.15
06		5.7	240				(2.5) 3.10
07		9.0	260				3.00
08		12.0	240				3.10 3.7
09		13.5	230				3.60 2.70
10		14.0	220				4.00 2.40
11		>14.4	210				4.20 2.30
12		>13.6	210				4.25 2.20
13		13.0	205				4.25 (2.15)
14		>12.8	205				4.15 (2.15)
15		>12.7	210				3.95 (2.15)
16		>12.6	210				3.60 2.15
17		12.6	245				111 3.00 (2.20)
18		(12.5)	270				127 2.30 (2.20)
19		12.5	330				>2.9 (2.30)
20		>12.0	420				(2.20)
21		(12.6)	330				1.7 (2.40)
22		12.8	240				1.8 (2.70)
23		(12.2)	215				(2.0) (2.85)

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 56

Townsville, Australia (19.3°S, 146.7°E)							
March 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		>6.2	260				
01		>6.4	290				
02		>6.0	250				
03		>5.9	270				
04		>6.5	275				
05		>6.0	280				2.0
06		>6.0	280				
07		>7.0	240				
08		>11.5	225			2.50	
09		>13.0	220			3.10 3.3	(3.50)
10		>13.0	210			3.50 3.7	(3.30)
11		>13.8	200			3.75 4.0	3.25
12	(360)	14.0	200			3.95 4.2	3.10
13	(350)	14.0	210			4.05	3.10
14	(330)	13.8	215			4.00	2.95
15		>13.0	220			3.90	2.95
16		>13.0	240			3.75 4.1	(2.95)
17		>10.0	250			3.50 4.0	(2.95)
18		>7.3	250			3.00 3.7	
19		>7.0	260			2.05 3.6	
20		>6.0	275			3.0	
21		>6.0	280				
22		>6.0	275				
23		>6.0	270				

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 57

Brisbane, Australia (27.5°S, 152.9°E)							
March 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		8.4	295				2.55
01		8.0	290				2.55
02		7.5	280				2.55
03		7.2	300				2.50
04		7.0	300				2.45
05		7.1	300				2.55
06		8.3	250				2.80
07		>8.5	240				<2.40
08		>8.5	230				2.80 2.9
09		>8.5	225				(3.35) 3.6
10		>8.5	220				(3.70) 4.3
11		>8.5	215				3.90 4.4
12		>8.5	210				(4.00) 4.4
13		>8.5	225				4.10
14		>8.5	230				4.00 4.2
15		>8.5	230				(3.95)
16		>8.5	240				3.75
17		>8.5	250				3.30
18		>8.5	250				2.80 3.0
19		(8.6)	260				E
20		>8.5	280				E (2.65)
21		>8.5	290				(2.55)
22		>8.5	290				(2.50)
23		8.4	285				2.55

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 58

Godhavn, Greenland (69.2°N, 53.5°W)							
February 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		(5.0)	260				(2.65)
01		(4.6)	265				(2.80)
02		(4.2)	265				(2.70)
03		(4.3)	275				(2.70)
04		(3.6)	280				2.80
05		(3.7)	300				---
06		(3.0)	275				(2.70)
07		(3.7)	<270				(2.45)
08		(5.1)	275				---
09		5.7	260				(2.95)
10		7.6	250				(3.15)
11		8.6	250				(3.10)
12		8.0	245				2.95
13		7.9	240				2.90
14		7.5	245				(2.80)
15		(7.4)	245				3.00
16		(7.0)	250				3.00
17		5.9	240				2.80
18		5.9	250				2.70
19		(6.6)	250				2.60
20		5.8	255				2.65
21		5.6	240				(2.65)
22		6.4	245				(2.75)
23		5.4	255				(2.75)

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 59

Townsville, Australia (19.3°S, 146.7°E)							
February 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		>6.5	255				
01		>6.5	255				
02		>6.0	265				
03		>6.4	270				
04		>6.5	290				
05		>6.4	300				
06		>6.4	300				
07		>7.9	250				
08	(255)	11.0	235				
09		11.2	225				
10	(340)	11.5	210				
11	350	12.0	210	5.9			
12	360	>12.2	210	6.3			
13	355	>12.0	200	6.0			
14	370	12.0	205	6.3			
15	380	11.6	220	6.2			
16	(370)	>11.0	230	5.8			
17		>9.2	240				
18		>8.4	250				
19		>7.0	270				
20		>6.0	300				
21		>6.4	300				
22		>7.0	300				
23		>7.0	270				

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 60<sup>a</sup>

Port Lockroy (64.8°S, 63.5°W)							
February 1957							
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00	310	(9.3)					1.0
01	315	(8.2)					1.1
02	320	(7.8)					0.9
03	345	(6.9)	(365)		(160)	(1.1)	1.1
04	395	(7.2)	340		(155)	1.6	1.8
05	390	(8.0)	290	(3.5)	140	1.9	3.0
06	400	(8.2)	265	(4.0)	125	2.3	3.2
07	375	(8.0)	250	(4.4)	120	2.7	3.8
08	(370)	7.8	245	(5.0)	115	3.0	4.1
09	435	(8.4)	240	(5.0)	115	3.2	4.5
10	(375)	8.3	235	(5.5)	115	3.3	4.8
11	(395)	8.5	235		110	3.3	4.8
12	(415)	8.5	230	(5.6)	115	3.3	4.7
13	(345)	8.4	225		(115)	(3.2)	4.6
14		8.2	230		(115)	(3.2)	3.7
15		8.2	230		(120)	(3.3)	3.3
16		7.9	240		115	3.1	3.2
17		7.9	250		120	3.0	2.6
18	250	(8.0)	250		120	2.7	3.0
19	270	(8.3)	260		125	2.3	3.0
20	275	(8.3)	275		135	1.8	2.2
21	290	(8.6)				(1.3)	2.1
22	295	(8.6)					1.4
23	305	(9.2)					1.8

Time: 60.0°W.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

<sup>a</sup>Average values except foF2 and fEs, which are median values.

Table 61

Godhavn, Greenland (69.2°N, 53.5°W) January 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		5.0	260				2.70
01		5.1	270				(2.90)
02		4.8	280				(2.65)
03		4.4	280				2.80
04		(4.5)	285				(2.80)
05		4.6	255				(2.75)
06		(4.4)	270				----
07		4.6	260				----
08		(4.2)	260				----
09		(5.1)	260				----
10		5.8	260				2.85
11		(7.5)	250				(2.90)
12		(7.8)	245				(2.90)
13		6.8	240				2.3
14		6.6	230				2.90
15		6.3	240				(2.85)
16		6.2	250				2.80
17		5.2	250				(2.75)
18		5.2	250				2.60
19		6.6	260				2.65
20		6.2	250				2.75
21		(6.0)	255				(2.75)
22		5.2	250				2.70
23		4.8	260				2.70

Time: 45.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 62\*

Singapore, British Malaya (1.3°N, 103.8°E) January 1957							
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00		285	10.4				1.3 2.4
01		290	10.4				2.5
02		285	10.2				2.6
03		270	9.6				2.7
04		255	8.2				2.8
05		245	7.0				2.9
06		270	6.2		(175)	1.4	1.5 2.7
07		280	8.2			130	2.6 2.8
08		265	9.2			115	3.4 2.5
09		240	10.2			110	3.8 4.0 2.2
10		250	10.9	(220)		110	4.1 2.0
11		280	11.7	(215)		110	4.2 1.9
12		265	12.2	(215)		110	4.3 1.9
13		285	12.6	210		110	4.3 1.9
14		265	12.5	(215)		110	4.2 1.9
15		260	12.6	(220)		110	3.9 1.9
16		275	12.4	(240)		115	3.5 1.9
17		265	12.1			120	3.0 3.5 1.9
18		300	11.8		(150)	2.1	3.2 1.9
19		385	11.4				3.6 1.9
20		415	>11.0				2.4 1.9
21		380	11.4				3.1 2.1
22		310	11.3				3.1 2.5
23		275	10.5				1.2 2.3

Time: 105.0°E.  
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.  
\*Average values except foF2 and fEs, which are median values.

Table 63

Talara, Peru (4.6°S, 81.3°W) January 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		(11.9)	280				(4.0) (2.65)
01		(10.6)	265				(4.1) (2.70)
02		(9.8)	255				(4.4) (2.80)
03		8.8	240				(4.4) 2.90
04		7.6	240				(4.2) 3.00
05		6.2	235				(3.5) 3.10
06		5.4	255				(4.1) 2.80
07		8.9	270		129	2.30	3.0 2.80
08		(12.4)	250		117	(3.20) (4.3)	(2.80)
09		13.9	235		111	3.75	4.2 2.75
10		14.0	225		111	4.05	2.55
11	(240)	14.2	215	---	111	4.25	4.3 2.45
12	---	14.4	215	---	111	4.25	2.40
13	(250)	14.4	210	6.7	111	4.25	2.35
14	---	(14.2)	210	6.7	111	(4.15)	2.30
15	---	>13.8	215	---	113	3.90	(2.30)
16	---	>13.6	230	---	113	3.65	3.8 (2.30)
17		>13.5	250		115	3.30	3.5 (2.25)
18		>13.2	270		123	2.55	3.3 (2.30)
19		>13.0	305				(3.2) (2.35)
20		>12.5	350				3.0 (2.40)
21		>12.9	330				3.0 (2.50)
22		>12.7	300				(3.2) (2.55)
23		12.6	290				(3.3) (2.45)

Time: 75.0°W.  
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 64

Townsville, Australia (19.3°S, 146.7°E) January 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		>8.2	300				(3.0)
01		>6.5	295				(3.5)
02		>6.2	295				(3.5)
03		>6.5	315				2.4 ----
04		>6.4	300				(2.0)
05		>6.0	300				----
06	---	>6.0	280	---		2.15	----
07	---	>8.6	250	---		3.00	(2.60)
08	---	>8.9	230	---		3.45	3.6 2.70
09	---	(10.2)	230	---		3.90	4.2 (2.50)
10	440	11.0	230	6.5		4.00	4.2 2.50
11	410	11.8	230	6.7		4.20	2.55
12	400	>12.0	230	6.6		4.30	4.6 2.55
13	400	12.2	230	6.4		4.30	4.7 2.55
14	390	12.0	240	6.3		4.15	4.7 2.60
15	400	11.8	240	6.3		4.00	4.9 2.50
16	400	11.0	230	6.0		3.70	4.6 2.55
17	---	>10.0	240	---		3.30	4.0 (2.60)
18		>8.5	260			2.65	(3.8) ----
19		>7.0	300			----	(3.5)
20		>6.0	340				(3.1)
21		>6.4	350				(2.4)
22		>6.0	350				(2.6)
23		>6.4	330				2.4

Time: 150.0°E.  
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 65

Hobart, Tasmania (42.9°S, 147.2°E) January 1957							
Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs (M3000)F2
00		7.4	300				2.45
01		7.0	300				2.40
02		6.4	320				2.40
03		6.0	330				2.40
04		>5.0	320			1.35	2.40
05	---	5.7	300	---		1.85	2.0 2.50
06	---	6.3	260	---		2.50	3.3 2.60
07	390	6.9	240	4.7		3.10	3.7 2.60
08	460	7.0	240	5.4		3.45	4.4 2.50
09	450	7.4	(240)	5.6		3.70	4.4 2.50
10	480	7.8	(230)	5.9		3.80	4.6 2.50
11	480	>7.6	---	6.0		3.80	4.4 2.40
12	480	8.0	---	6.0		3.80	4.5 2.40
13	490	8.0	(240)	(6.0)		3.75	4.6 2.40
14	490	7.6	(230)	5.8		4.7	2.40
15	480	7.6	230	5.8		3.70	4.2 2.40
16	460	>7.5	230	5.5		3.70	2.40
17	440	>7.5	240	5.1		3.40	4.0 2.45
18	440	7.7	250	4.6		2.90	3.9 2.50
19		7.6	(285)			<2.20	4.0 2.50
20		7.8	295			<2.10	4.0 2.50
21		>8.0	315			5.0	2.35
22		8.2	320			3.7	2.35
23		>7.5	310			3.5	2.40

Time: 150.0°E.  
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 66\*

Port Lockroy (64.8°S, 63.5°W) January 1957							
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00		340	(9.4)		(165)	(1.4)	2.3 ----
01		345	(10.4)		(140)	1.3	2.2 ----
02		360	(10.3)	350	(150)	1.4	2.2 ----
03		380	(10.0)	330		1.5	2.6 ----
04		390	(10.4)	305		1.25	2.0 3.1 ----
05		400	(10.8)	275	4.2	1.20	2.4 4.4 ----
06		405	(10.7)	260	4.5	1.15	2.8 4.8 ----
07		435	(9.7)	245	5.0	1.15	3.1 5.8 ----
08		410	9.8	240	5.3	1.15	3.3 5.6 (2.4)
09		450	8.7	245	5.5	1.15	3.4 5.1 2.4
10		460	8.1	235	5.7	1.10	3.6 6.0 (2.5)
11		490	7.9	240	5.7	1.10	3.7 6.2 (2.4)
12		490	7.4	240	5.8	1.10	3.9 6.5 (2.4)
13		470	7.1	240	5.8	1.10	3.8 7.5 (2.5)
14		455	7.2	240	5.7	1.10	3.8 7.0 ----
15		455	7.4	255	5.7	1.10	3.7 7.0 (2.6)
16		450	7.4	250	5.5	1.15	3.5 6.7 2.5
17		445	7.6	260	5.4	1.15	3.3 6.3 2.6
18		(420)	7.6	255		1.15	3.0 5.7 (2.7)
19		---	(7.9)	265		1.20	2.7 5.4 ----
20		(315)	(8.2)	275		1.20	2.3 4.6 (2.7)
21		310	(8.3)	(305)		(120)	1.7 3.7 ----
22		310	(8.6)	(320)		(135)	1.5 1.9 ----
23		325	(8.8)	(355)		(150)	1.4 1.6 ----

Time: 60.0°W.  
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.  
\*Average values except foF2 and fEs, which are median values.

Table 67\*

Ibadan, Nigeria (7.4°N, 4.0°E)								
December 1956								
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	(8.9)					3.8	---
01	270	9.6					4.2	---
02	260	(10.0)					5.4	(2.9)
03	250	9.2					4.7	---
04	230	(7.6)					4.0	---
05	230	(7.8)					>4.4	---
06	280	(8.4)					>5.7	---
07		>10.0	255		150	1.85	3.00	>8.9
08		11.7	240		(120)	3.5	10.2	2.5
09		12.2	230			3.85	13.3	2.3
10		12.4	225			4.1	13.9	2.1
11		12.4	220			4.2	13.9	2.0
12		12.4	220			4.2	13.8	1.9
13		12.4	215			4.1	13.9	1.9
14		12.2	220			3.9	13.9	1.9
15		12.2	235			3.65	13.3	1.9
16		>11.4	255			3.2	10.7	(1.9)
17	285	>9.2				2.35	>8.4	---
18	365	10.3				1.3	3.2	1.8
19	470	8.8						---
20	495	(8.2)						---
21	425	(8.6)						---
22	340	>9.0						---
23	295	(8.6)					3.8	---

Time: 0.0°.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 68\*

Inverness, Scotland (57.4°N, 4.2°W)								
September 1956								
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	330	5.2					1.2	2.4
01	335	4.9					2.4	2.3
02	345	4.6					2.3	2.3
03	340	4.4					2.4	2.3
04	335	3.8					2.4	2.4
05	310	3.8			(125)	(1.6)	1.2	2.5
06	275	4.8				130	1.8	2.7
07	260	6.0	---	---		125	2.3	2.9
08	290	6.8	(245)	(4.3)		110	2.8	2.8
09	325	7.4	240	(4.7)		110	3.1	2.8
10	315	7.8	240	5.0		110	3.3	2.8
11	345	8.2	235	5.2		105	3.5	2.8
12	320	8.2	240	5.2		105	3.5	2.7
13	320	8.7	245	5.3		105	3.4	2.7
14	325	9.0	240	5.3		110	3.4	2.7
15	310	8.8	245	(5.0)		110	3.2	2.7
16	285	8.6	(260)	(4.5)		110	3.0	2.7
17	270	8.8	---	---		115	2.5	2.8
18	260	8.7	---	---		130	2.1	2.8
19	255	8.6	---	---		(1.8)	2.5	2.8
20	265	7.6					2.4	2.7
21	275	6.9						2.6
22	295	6.0					2.4	2.4
23	325	5.7						2.4

Time: 0.0°.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 69

Lulea, Sweden (65.6°N, 22.1°E)								
August 1956								
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	---					2.5	---
01	290	---					2.5	---
02	280	---					2.6	---
03	---	(5.7)	290	---	---	1.6	2.4	---
04	---	5.9	250	3.9	110	2.3	2.5	---
05	(340)	5.9	240	4.2	110	2.7	2.6	---
06	(360)	6.0	---	4.5	100	---	---	---
07	(350)	6.8	---	4.8	110	---	---	---
08	(370)	6.9	---	5.0	100	---	---	---
09	(350)	7.0	---	5.0	100	---	3.8	---
10	355	7.1	210	5.2	---	---	---	---
11	(360)	7.0	210	5.1	100	---	3.9	---
12	---	7.2	210	5.0	100	---	---	(2.7)
13	---	7.0	---	5.2	100	---	---	---
14	---	6.8	---	5.0	100	---	---	---
15	---	6.7	---	4.7	100	---	---	---
16	---	6.6	---	---	110	---	---	---
17	---	(6.0)	240	---	110	2.3	3.1	---
18	---	---	240	---	---	2.0	2.9	---
19	(260)	---	250	---	---	1.8	2.0	---
20	260	---	---	---	---	1.6	2.3	---
21	280	---	---	---	---		2.4	---
22	280	---	---	---	---		2.4	---
23	280	---	---	---	---		2.4	---

Time: 15.0°E.

Sweep: 1.5 Mc to 10.0 Mc in 9 minutes, automatic operation.

Table 71

Calcutta, India (22.9°N, 88.5°E)								
June 1956								
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	5.6					3.1	3.1
01	300	5.5					2.1	3.0
02	300	5.5					3.0	2.9
03	280	5.2					2.1	3.0
04	280	4.8					2.1	3.1
05	265	4.6					2.1	3.1
06	260	6.2	---	---	110	2.5	3.4	3.2
07	280	7.3	230	4.5	100	2.8	3.5	3.3
08	300	7.6	210	4.9	---	---	5.0	3.2
09	320	8.0	---	5.2	---	---	5.1	3.0
10	(325)	(9.2)	---	5.3	---	---	5.5	(3.0)
11	(350)	(10.4)	---	5.3	---	---	5.4	(2.85)
12	(360)	(10.9)	210	5.3	100	3.7	5.5	(2.65)
13	370	(11.5)	230	5.3	100	3.7	5.2	(2.8)
14	360	11.8	220	5.3	100	3.4	5.2	2.8
15	340	11.3	220	5.2	100	3.4	4.4	2.9
16	330	11.2	220	5.1	100	3.2		3.1
17	300	10.7	220	4.8	100	3.0		3.2
18	295	10.2	230	4.2	110	2.6	3.5	3.3
19	275	9.5					2.3	3.4
20	290	8.6					2.1	3.2
21	300	8.0					2.0	3.1
22	290	6.8					2.5	3.0
23	305	6.8					2.1	3.1

Time: 90.0°E.

Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 70

Calcutta, India (22.9°N, 88.5°E)								
July 1956*								
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	265	6.4					2.1	3.3
01	270	5.5					2.0	3.3
02	260	5.0					1.8	3.3
03	250	4.6						3.3
04	250	4.3					2.0	3.25
05	260	4.4					2.0	3.3
06	250	6.8	230	---	100	2.6	3.0	3.3
07	(260)	7.6	220	4.6	100	2.8	3.2	3.35
08	275	9.5	210	5.0	100	3.1	3.8	3.1
09	300	10.5	200	5.2	---	---	4.6	2.9
10	330	11.5	200	5.3	---	---	5.2	2.8
11	350	12.0	---	5.5	---	---	5.2	3.0
12	395	12.5	---	5.6	---	---	5.5	2.75
13	410	12.7	---	5.5	---	---	5.5	(2.6)
14	400	12.5	220	5.4	---	---	5.1	2.8
15	360	12.5	220	5.2	---	---	4.0	3.1
16	340	11.8	220	5.1	---	---	3.8	3.3
17	310	11.5	230	4.7	---	---	3.6	3.3
18	280	11.0			---	---	3.5	3.2
19	280	9.6			---	---	3.2	3.4
20	290	8.0			---	---	3.0	3.3
21	300	7.2			---	---	2.0	3.2
22	300	9.0			---	---		3.1
23	290	7.8			---	---	2.0	3.2

Time: 90.0°E.

Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

\*Data observed from July 1, 1956, to July 24, 1956, inclusive.

Table 72\*

Campbell I. (52.5°S, 169.2°E)								
December 1954								
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05	260	4.3	240	---	140	2.1		3.2
06	310	4.6	240	3.7	125	2.5		3.1
07	330	5.1	230	4.0	120	2.8		3.1
08	330	5.2	230	4.2	120	3.0	4.4	3.1
09	340	5.5	230	4.3	120	3.1	4.4	3.1
10	350	5.5	220	4.4	120	3.2	4.1	3.0
11	330	5.6	220	4.4	120	3.2	3.9	3.1
12	340	5.6	230	4.4	120	3.3	3.7	3.0
13	340	5.7	220	4.4	120	3.5		3.05
14	340	5.6	230	4.3	120	3.2		3.0
15	340	5.5	230	4.3	120	3.2		3.0
16	320	5.6	240	4.1	125	2.8		3.0
17	310	5.7	240	3.9	130	2.7		3.0
18	300	5.9	250	3.6	130	2.3		3.0
19	270	5.8	240	---	145	2.1		3.0
20	270	6.0					2.4	3.0
21	260	5.8						3.0
22	260	5.4						3.0
23	280	4.9						2.9

Time: 165.0°E.

Sweep: 1.0 Mc to 15.0 Mc in 5 minutes, manual operation.

\*Observations taken on a 19-hour working schedule.



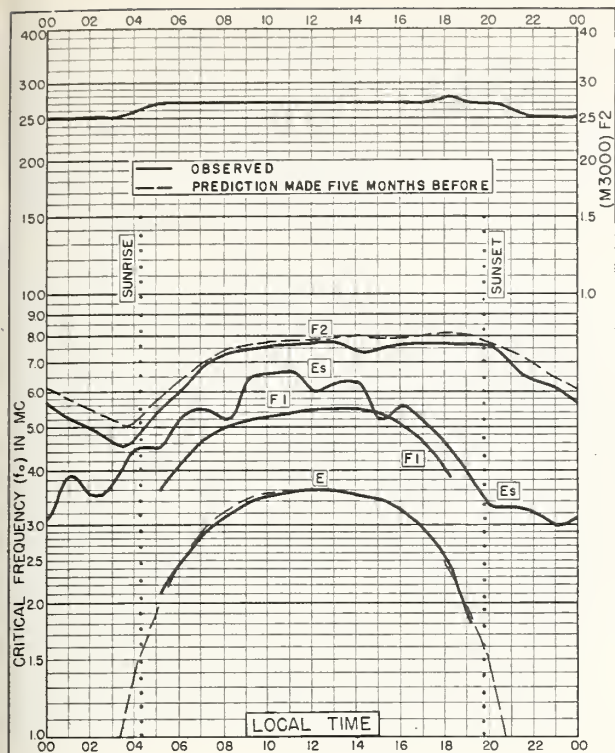


Fig. 1. UPSALA, SWEDEN  
59.8°N, 17.6°E

AUGUST 1957

NBS 503

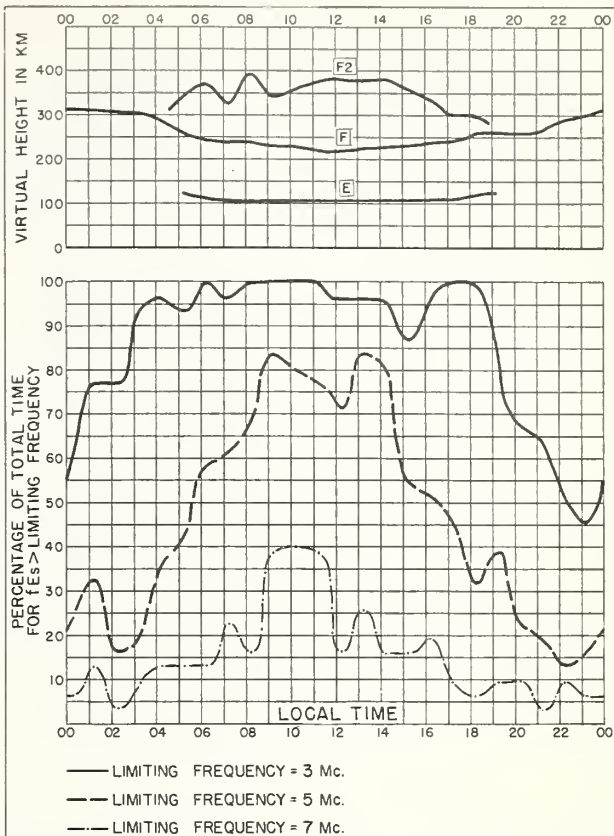


Fig. 2. UPSALA, SWEDEN

AUGUST 1957

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957

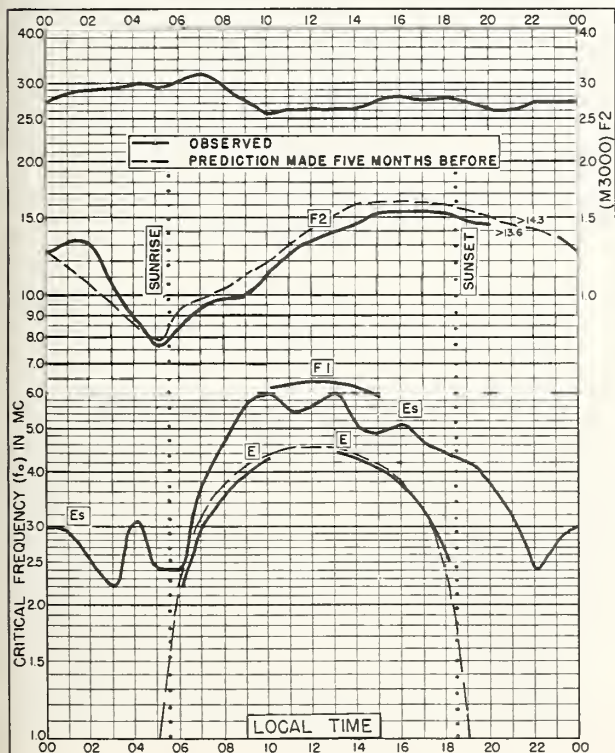


Fig. 3. FORMOSA, CHINA  
25.0°N, 121.5°E

AUGUST 1957

NBS 503

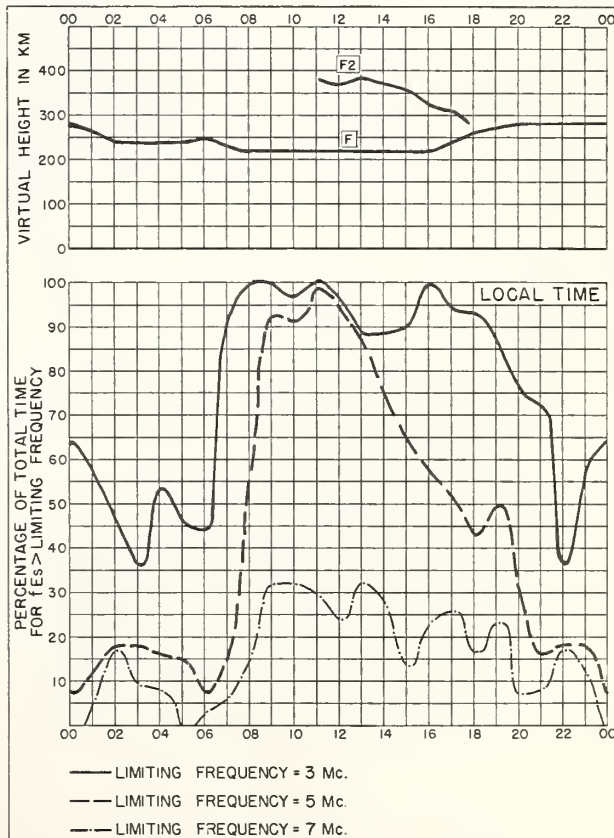


Fig. 4. FORMOSA, CHINA

AUGUST 1957

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957

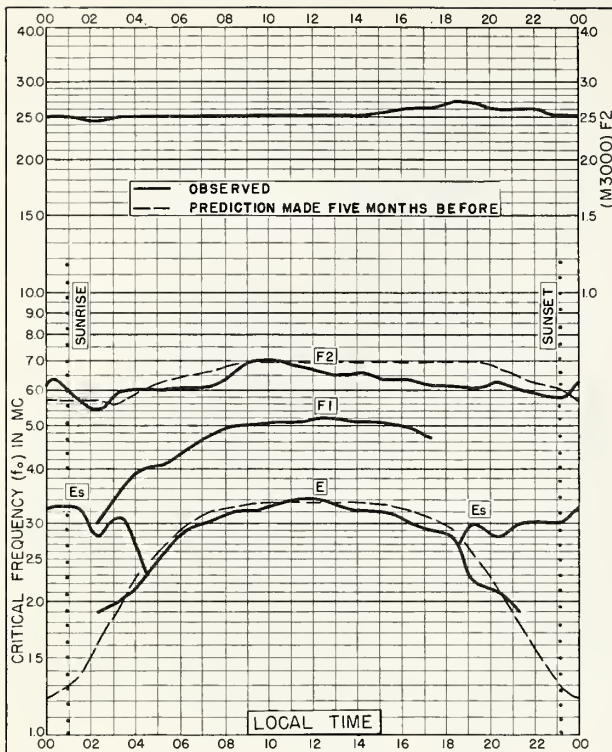


Fig. 5. KIRUNA, SWEDEN  
67.8°N, 20.3°E

JULY 1957

NBS 503

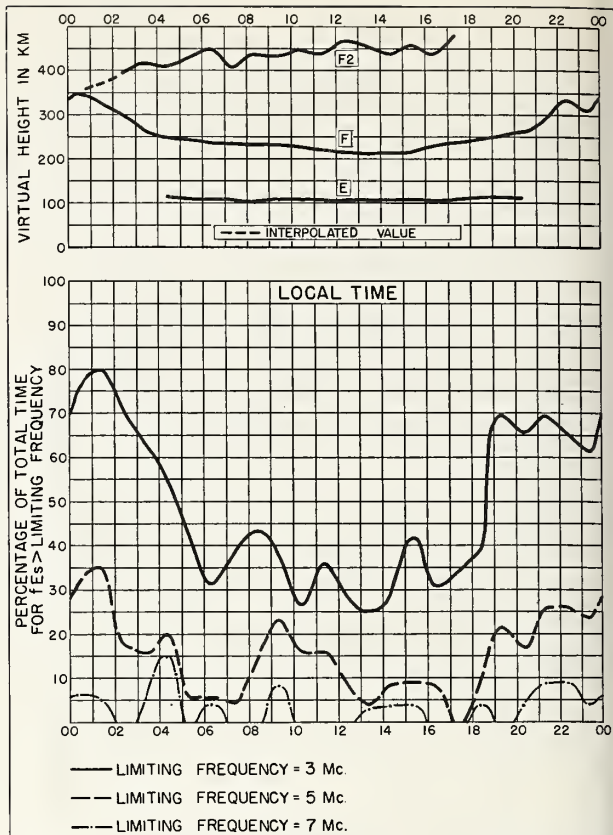


Fig. 6. KIRUNA, SWEDEN

JULY 1957

NBS 490

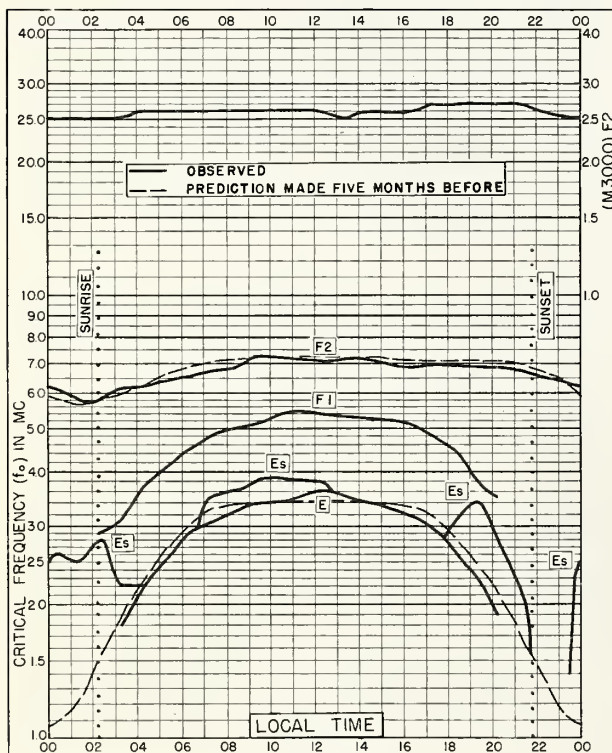


Fig. 7. LYCKSELE, SWEDEN  
64.6°N, 18.8°E

JULY 1957

NBS 503

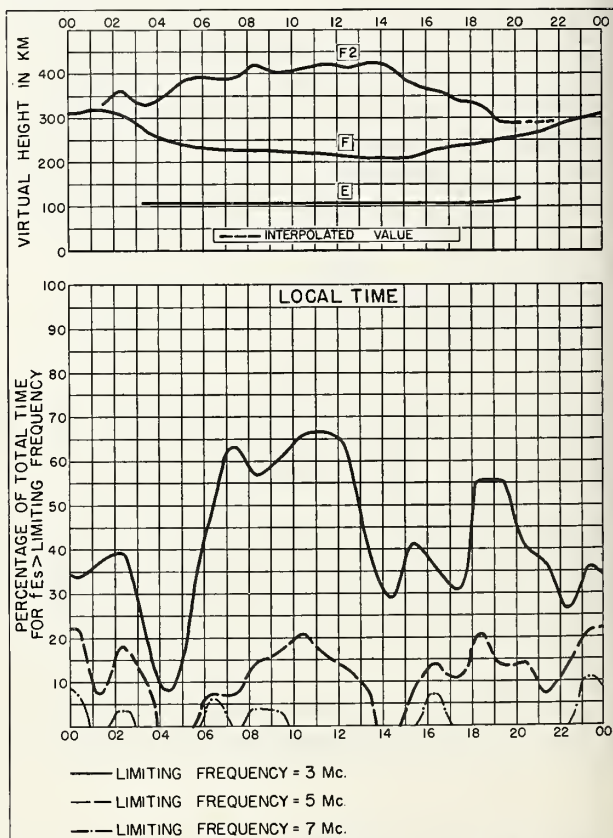


Fig. 8. LYCKSELE, SWEDEN

JULY 1957

NBS 490



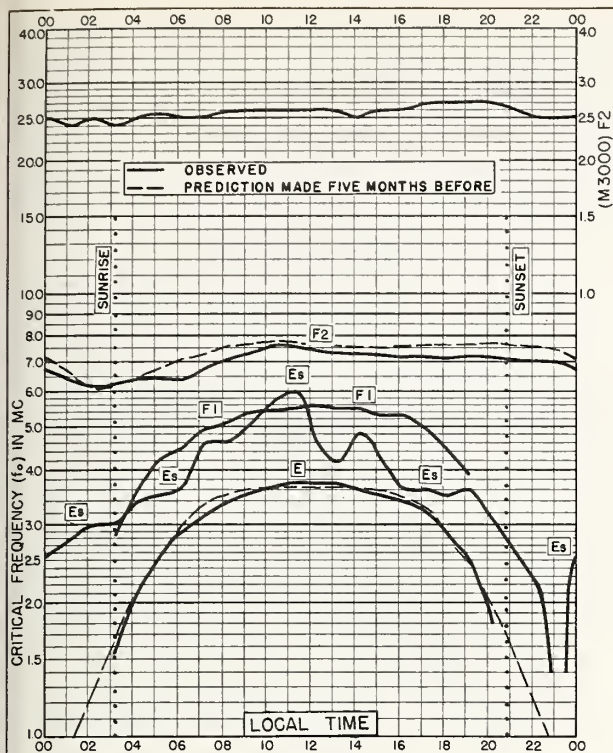


Fig. 9. UPSALA, SWEDEN  
59.8°N, 17.6°E

JULY 1957

NBS 503

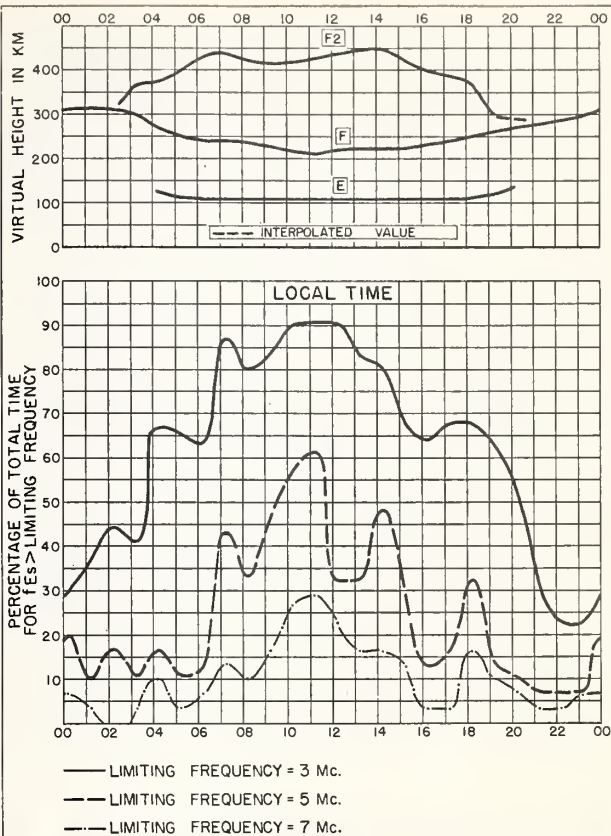


Fig. 10. UPSALA, SWEDEN

JULY 1957

NBS 490

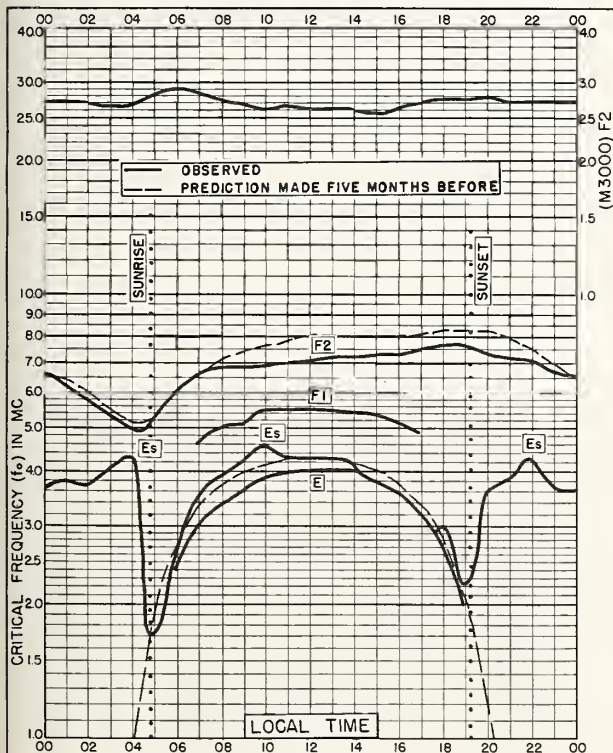


Fig. 11. WASHINGTON, D.C.  
38.7°N, 77.1°W

JULY 1957

NBS 503

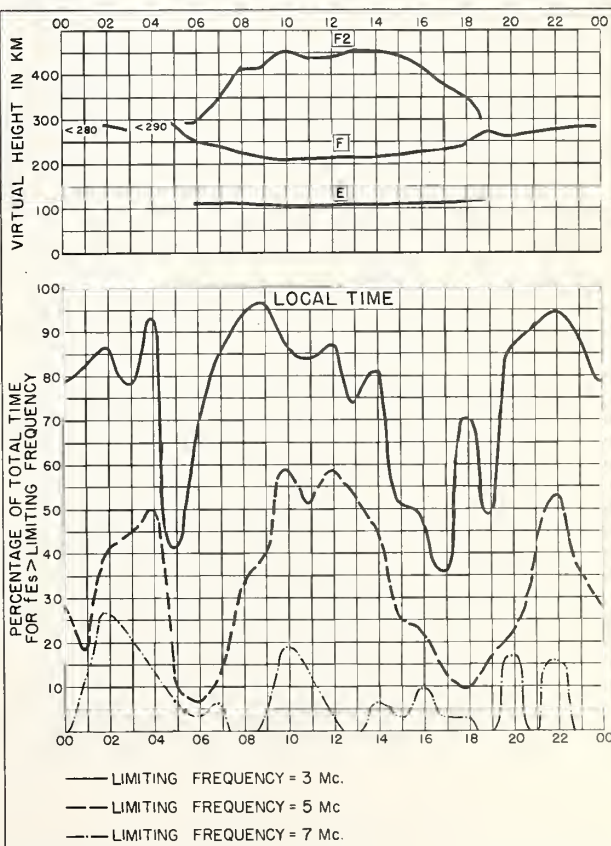


Fig. 12. WASHINGTON, D.C.

JULY 1957

NBS 490

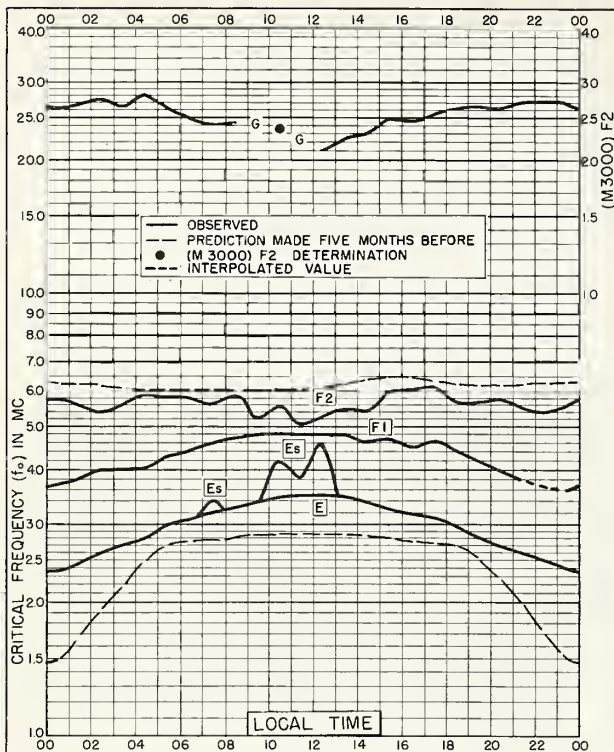


Fig. 13. THULE, GREENLAND  
76.6°N, 68.7°W

JUNE 1957

NBS 503

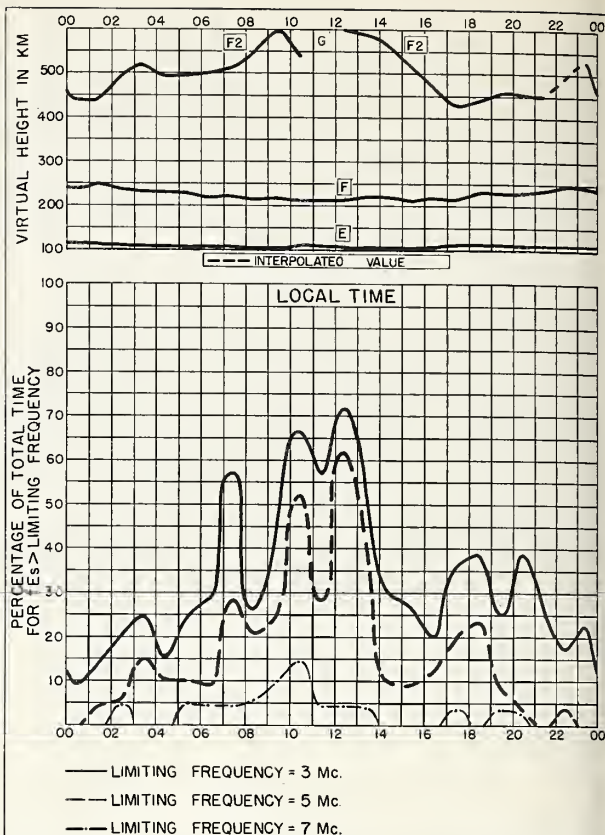


Fig. 14. THULE, GREENLAND

JUNE 1957

NBS 490

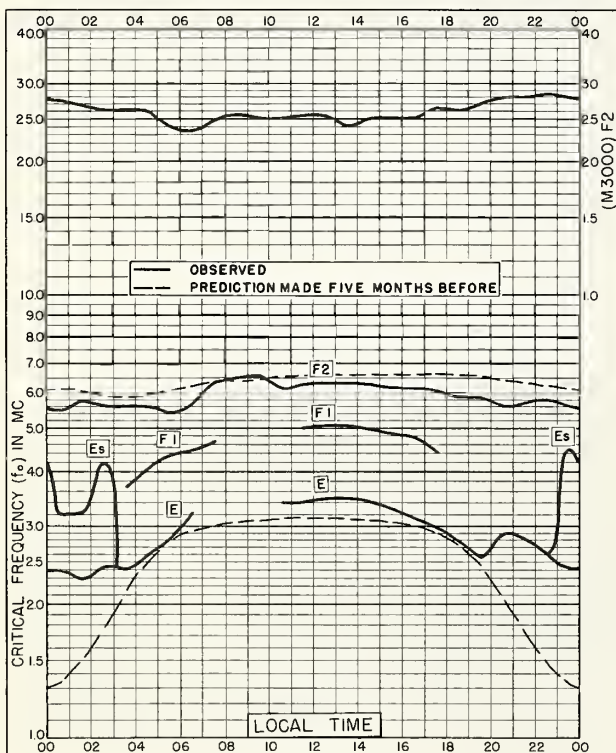


Fig. 15. POINT BARROW, ALASKA  
71.3°N, 156.8°W

JUNE 1957

NBS 503

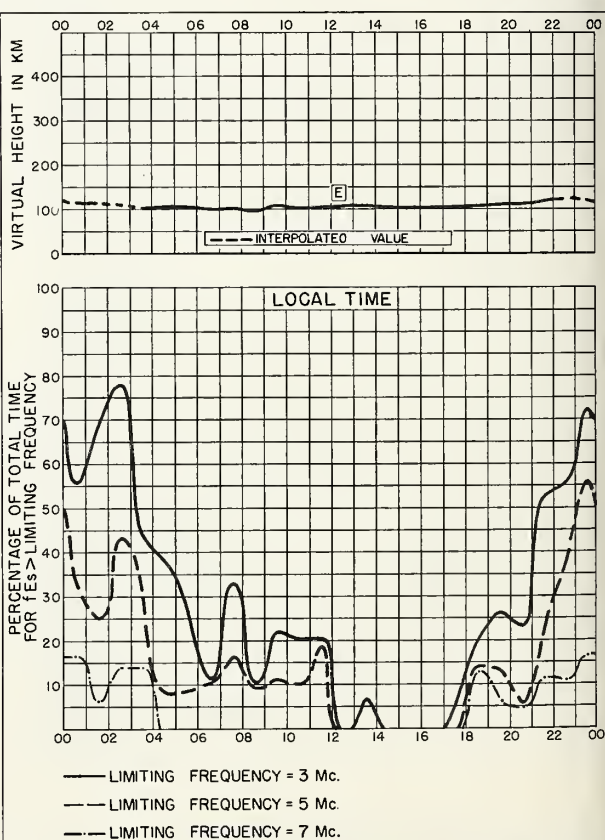


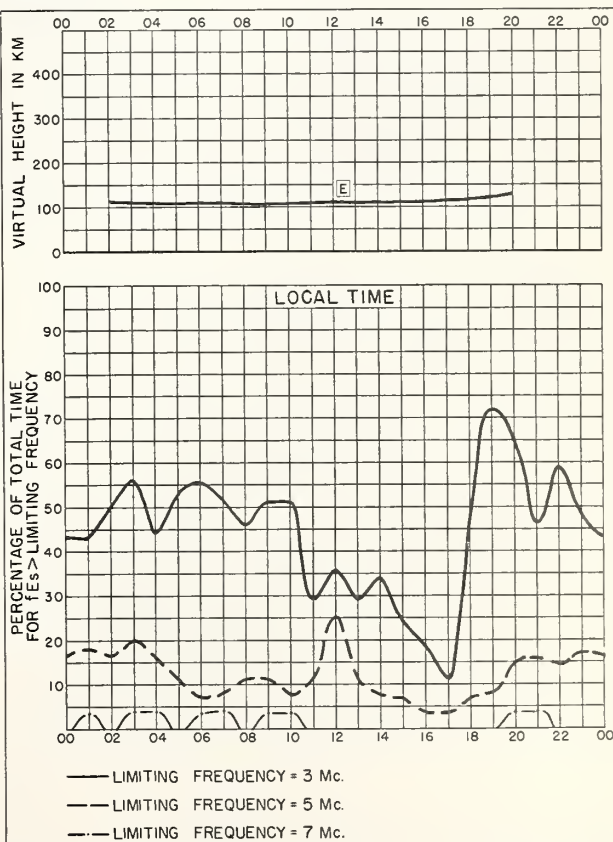
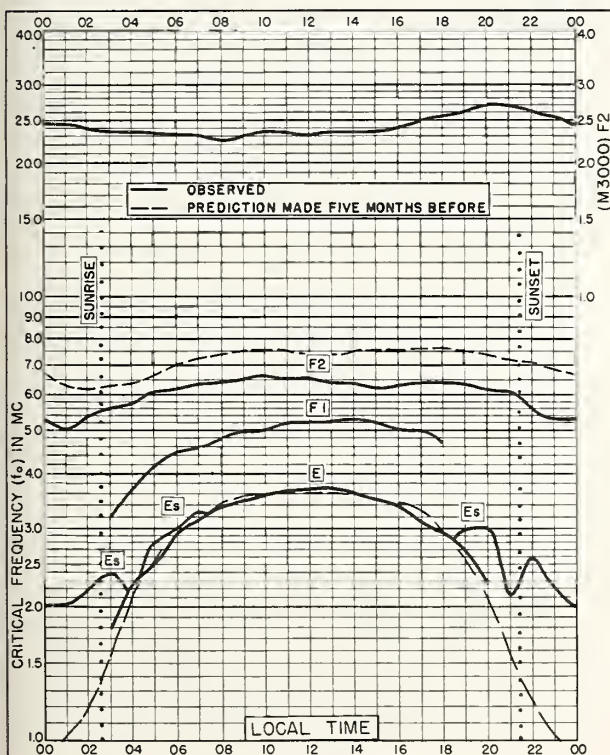
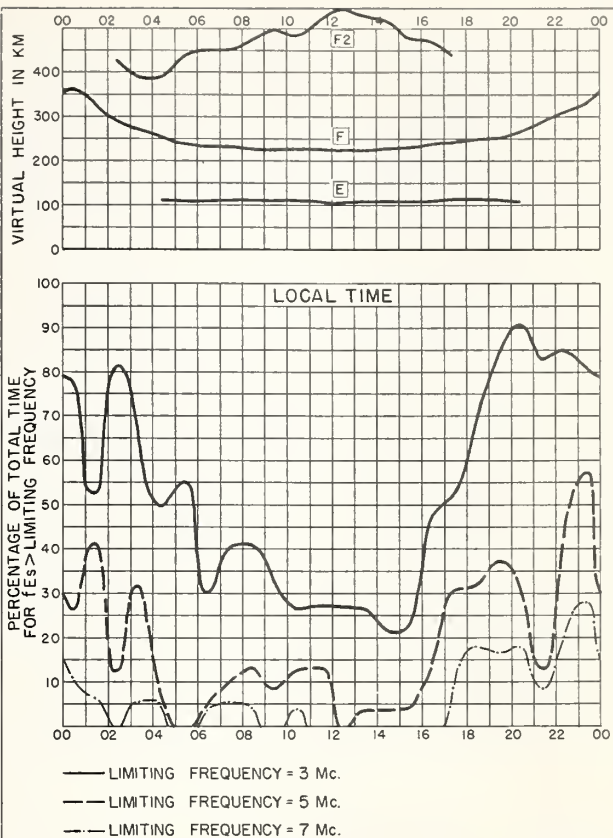
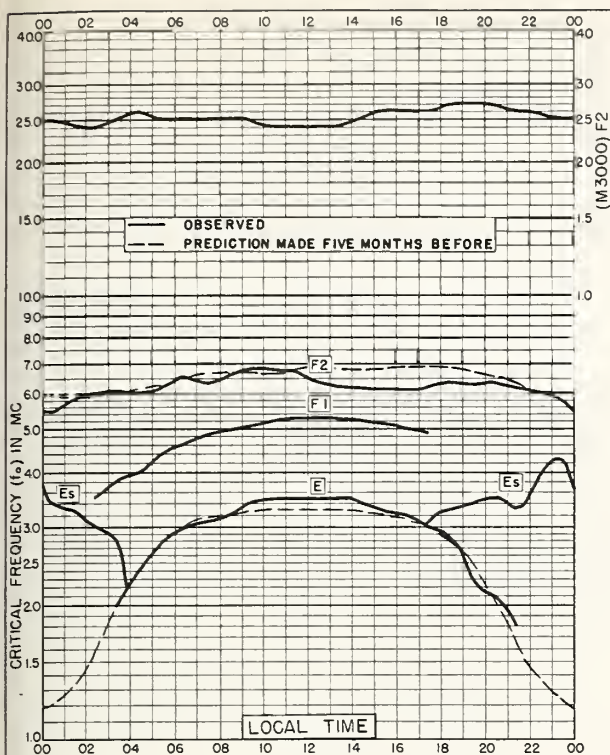
Fig. 16. POINT BARROW, ALASKA

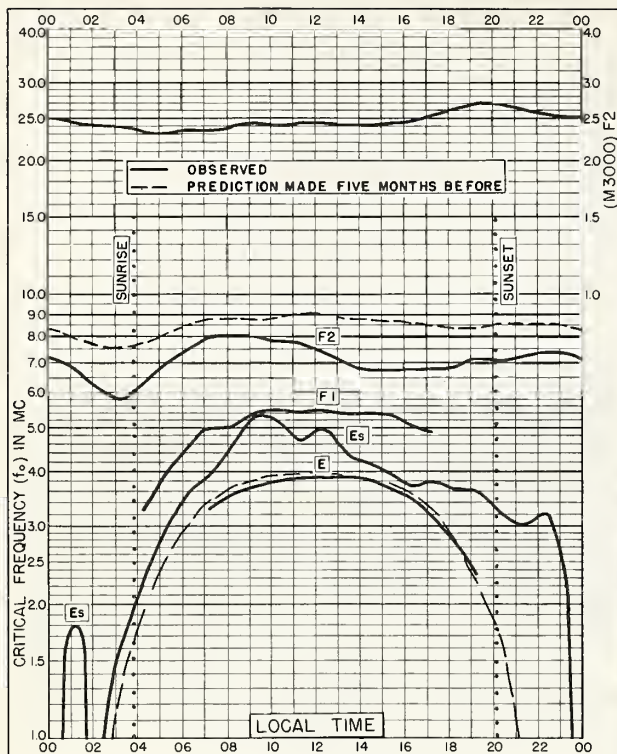
JUNE 1957

NBS 490

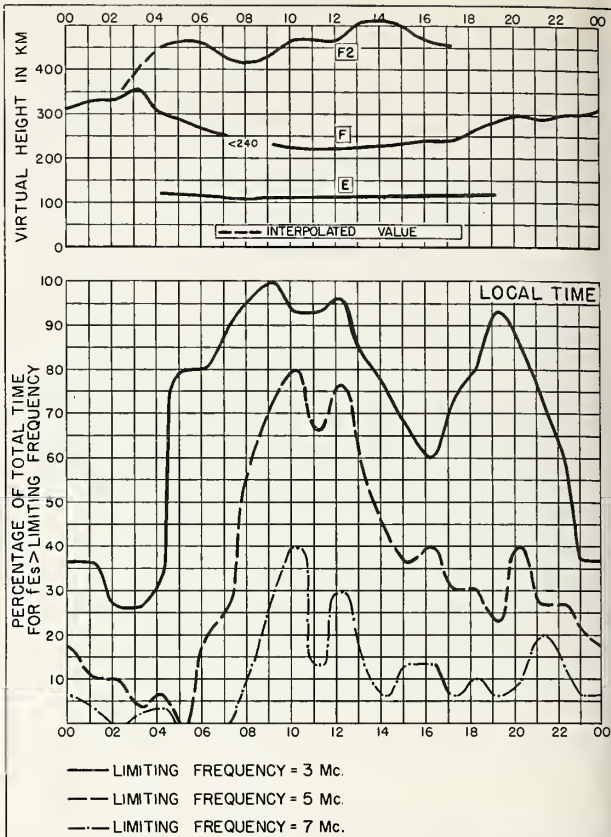
U. S. GOVERNMENT PRINTING OFFICE 11-5877



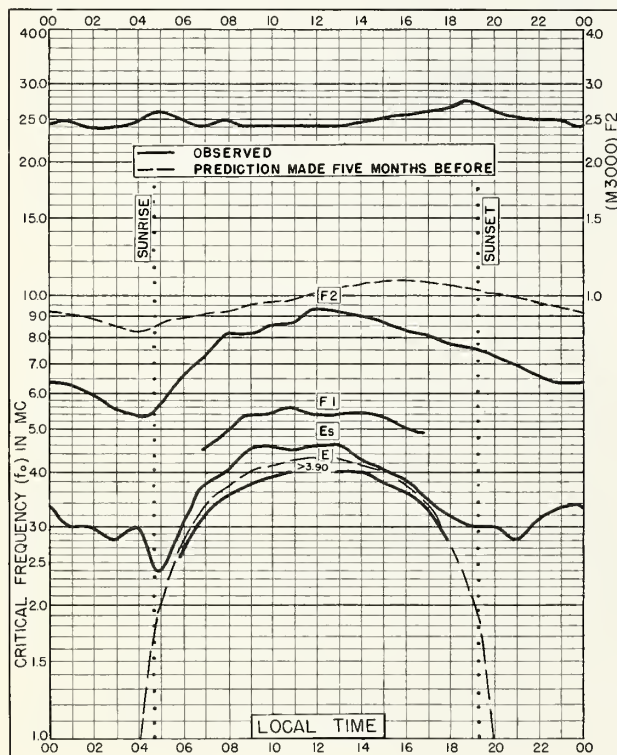




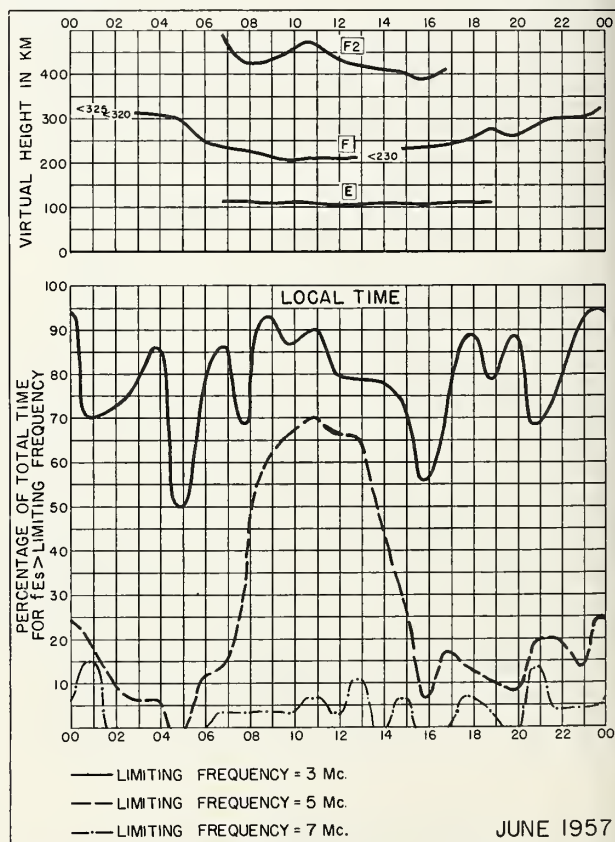
NBS 503



NBS 490



NBS 503



NBS 490



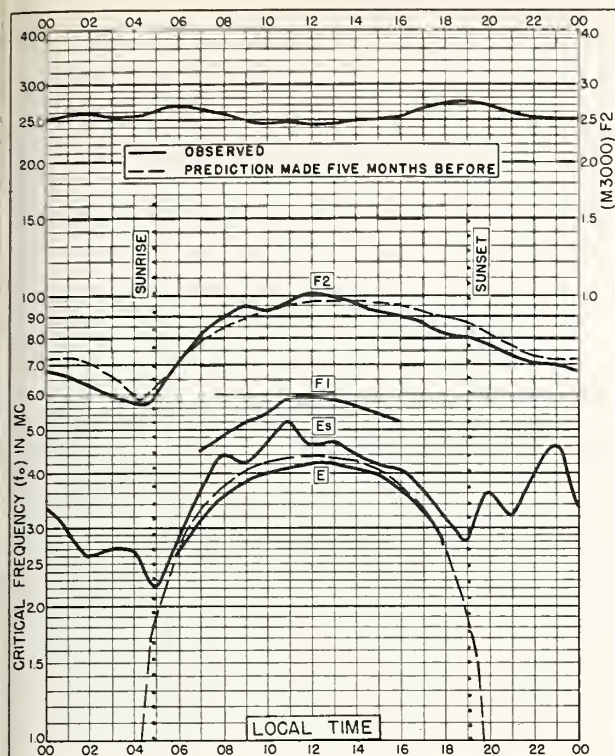


Fig. 25. WHITE SANDS, NEW MEXICO  
32.3°N, 106.5°W  
JUNE 1957

NBS 503

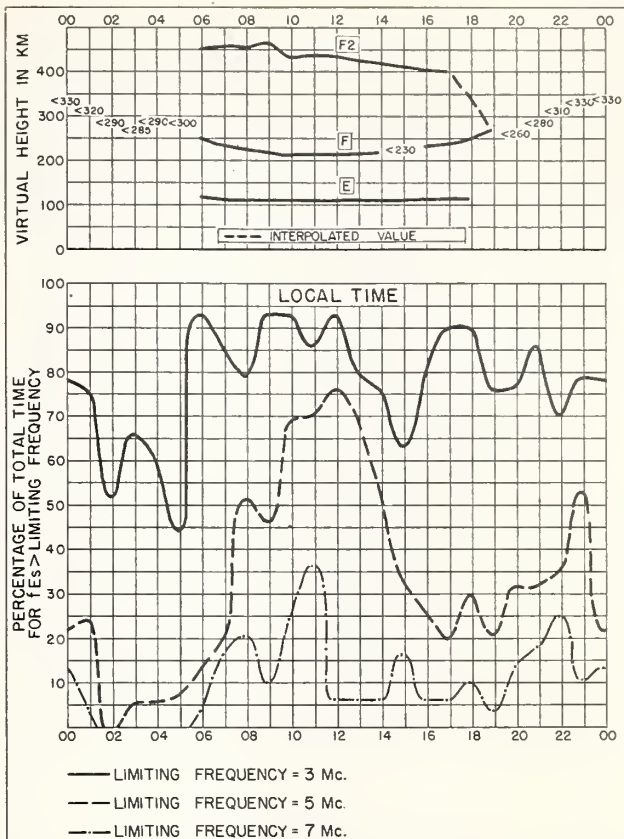


Fig. 26. WHITE SANDS, NEW MEXICO  
JUNE 1957

NBS 490

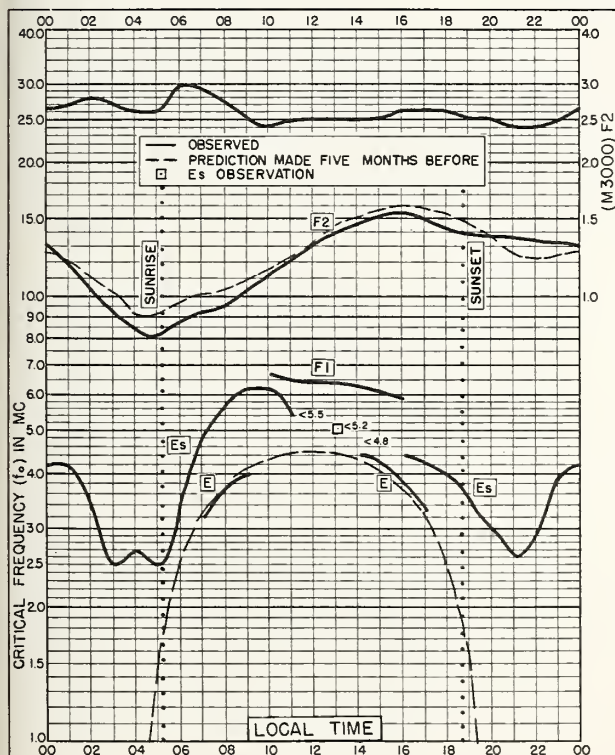


Fig. 27. FORMOSA, CHINA  
25.0°N, 121.5°E  
JUNE 1957

NBS 503

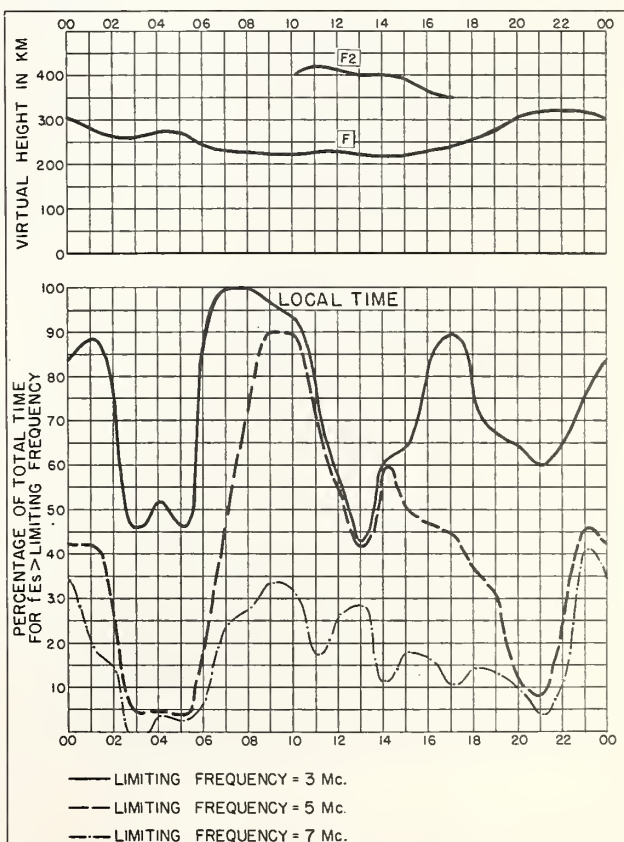


Fig. 28. FORMOSA, CHINA  
JUNE 1957

NBS 490

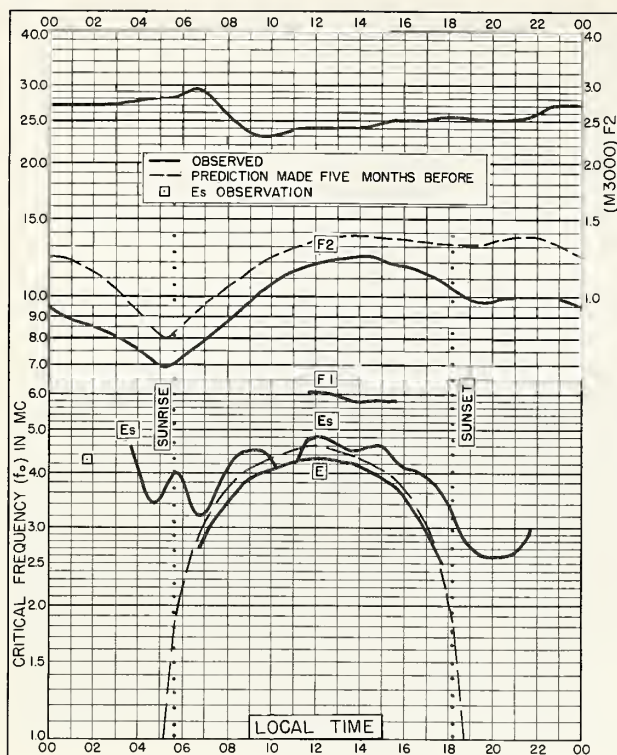


Fig. 29. PANAMA CANAL ZONE  
9.4°N, 79.9°W

JUNE 1957

NBS 503

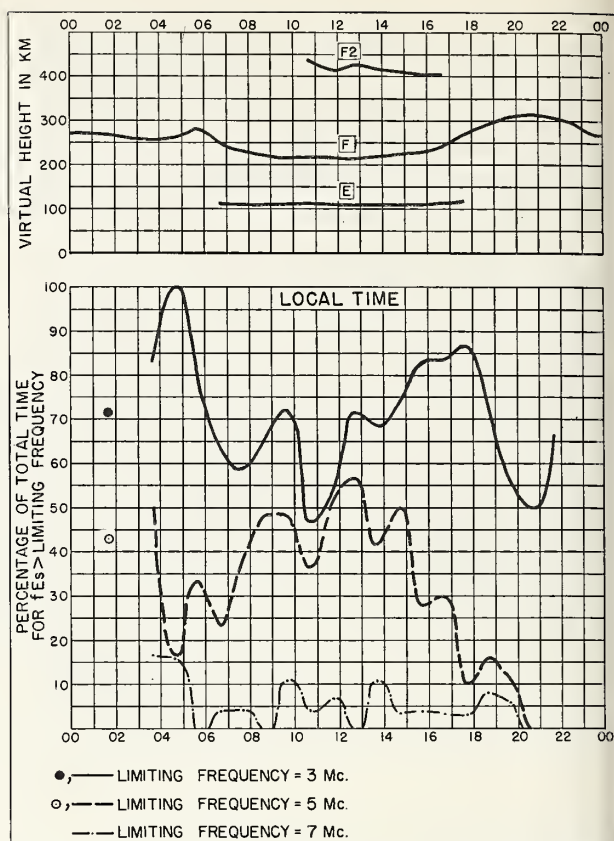


Fig. 30. PANAMA CANAL ZONE

JUNE 1957

NBS 490

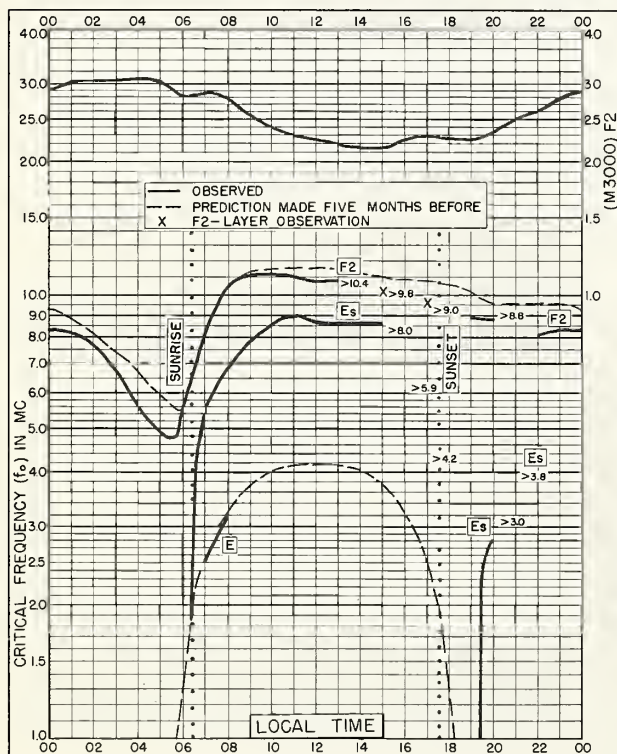


Fig. 31. HUANCAYO, PERU  
12.0°S, 75.3°W

JUNE 1957

NBS 503

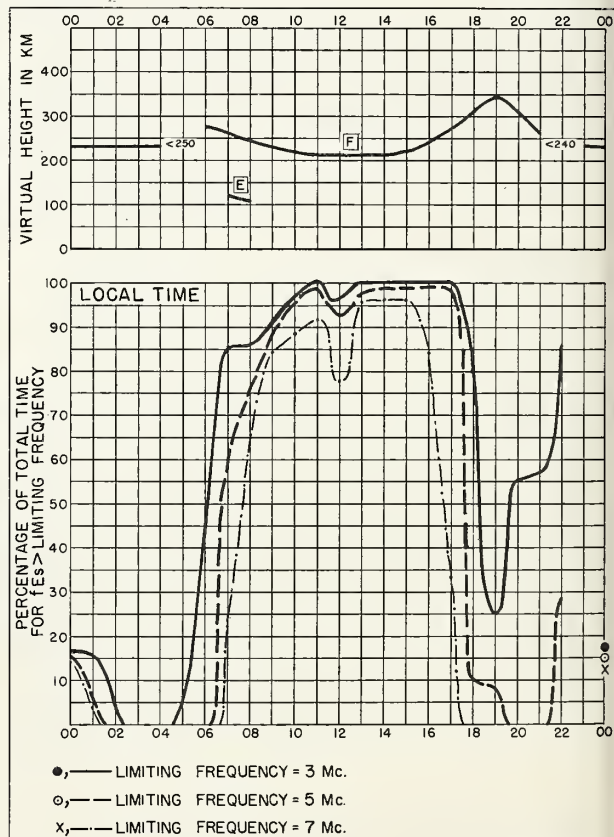


Fig. 32. HUANCAYO, PERU

JUNE 1957

NBS 490



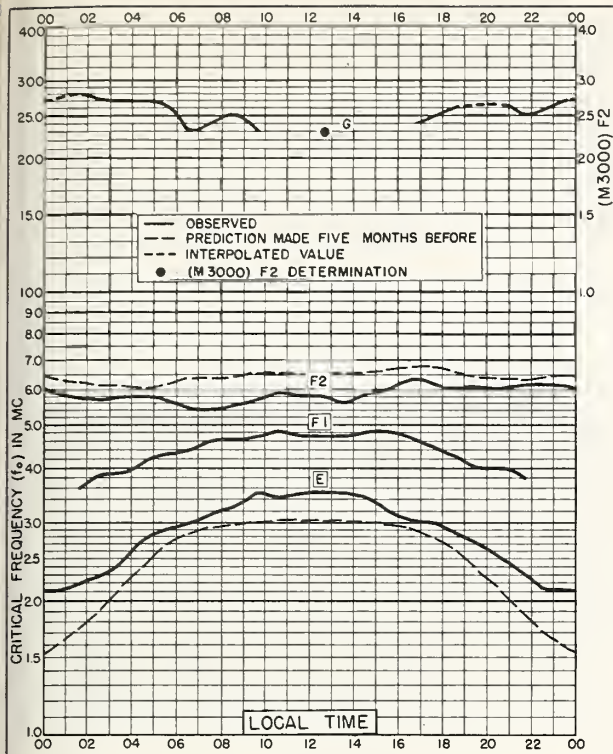


Fig. 33. RESOLUTE BAY, CANADA  
74.7°N, 94.9°W

MAY 1957

NBS 503

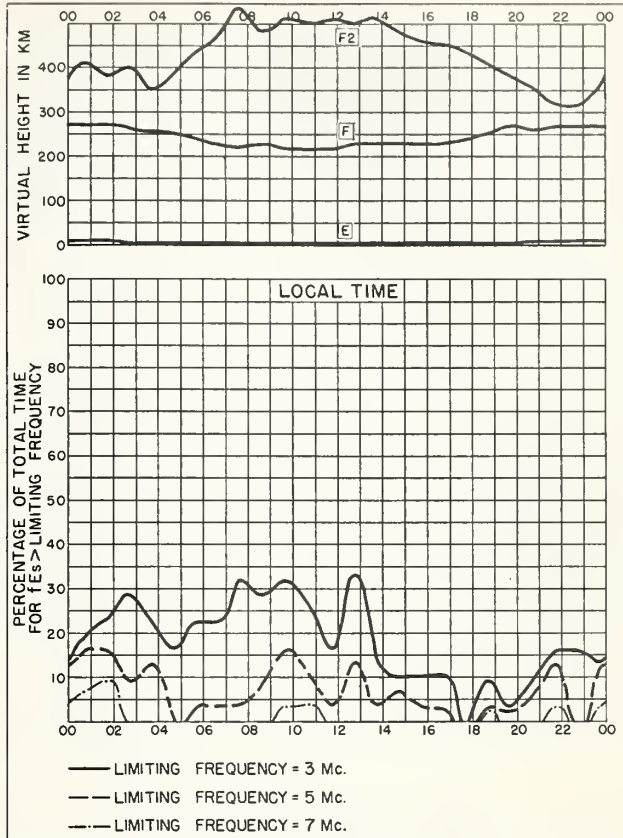


Fig. 34. RESOLUTE BAY, CANADA

MAY 1957

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957

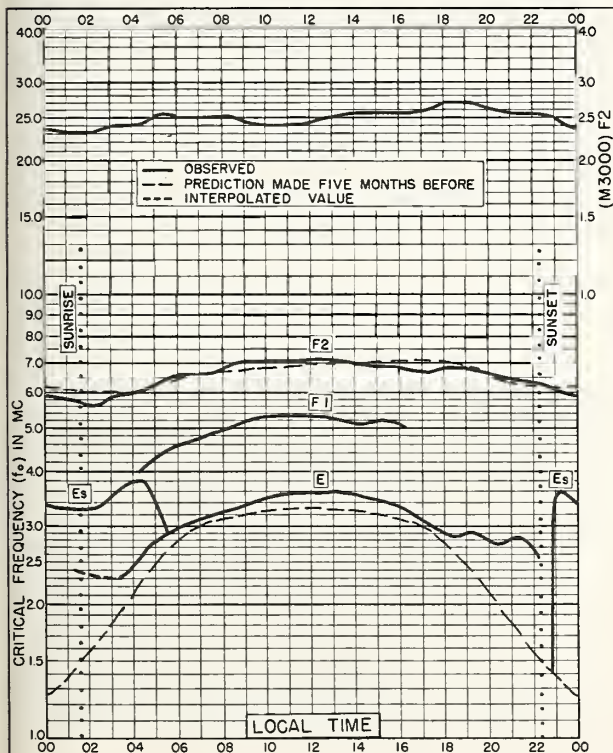


Fig. 35. TROMSØ, NORWAY  
69.7°N, 19.0°E

MAY 1957

NBS 503

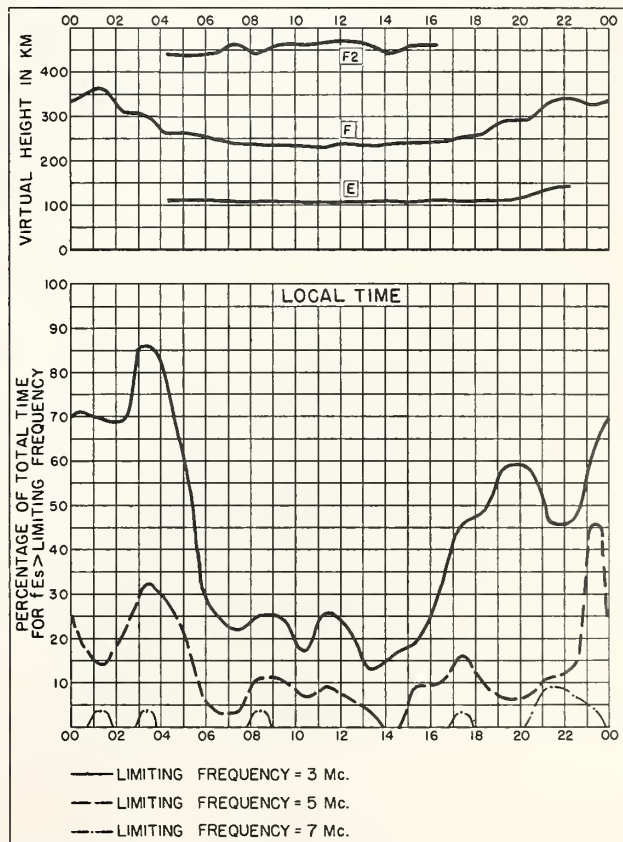


Fig. 36. TROMSØ, NORWAY

MAY 1957

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957

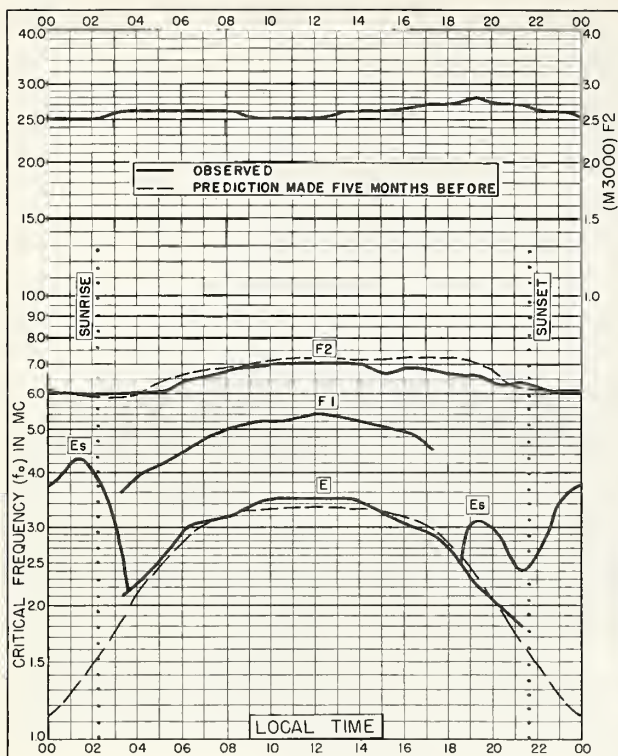


Fig. 37. KIRUNA, SWEDEN  
67.8°N, 20.3°E

MAY 1957

NBS 503

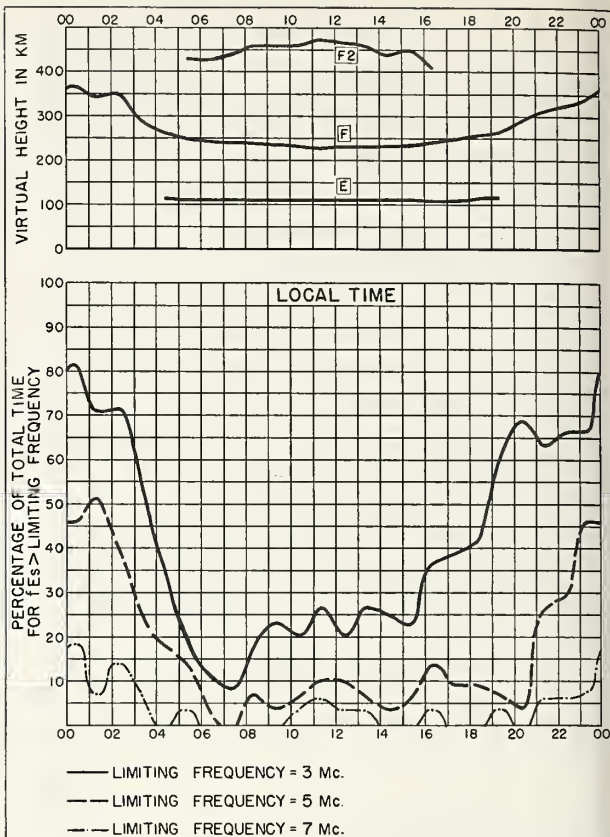


Fig. 38. KIRUNA, SWEDEN

MAY 1957

NBS 490

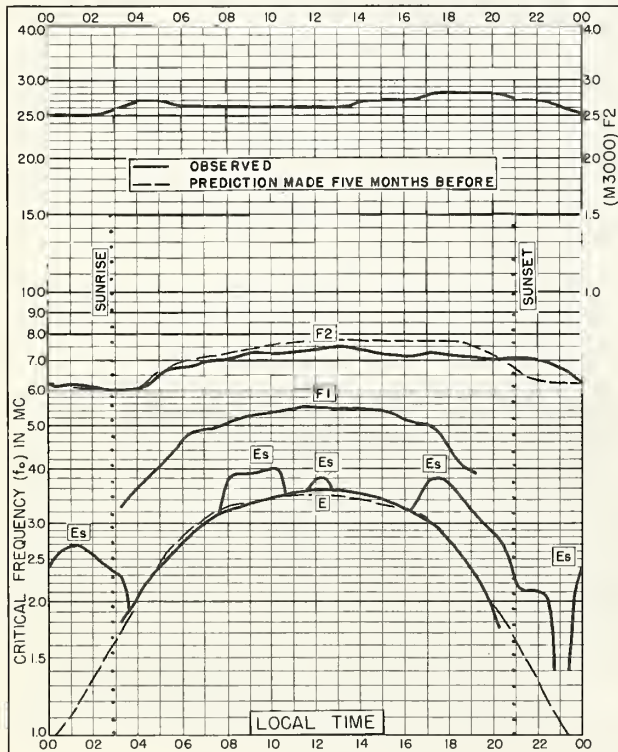


Fig. 39. LYCKSELE, SWEDEN  
64.6°N, 18.8°E

MAY 1957

NBS 503

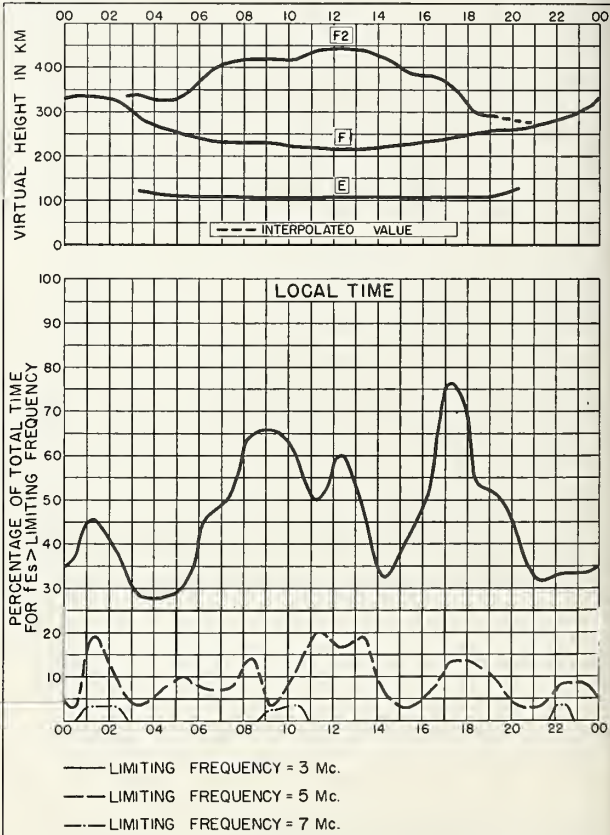


Fig. 40. LYCKSELE, SWEDEN

MAY 1957

NBS 490

NBS 490



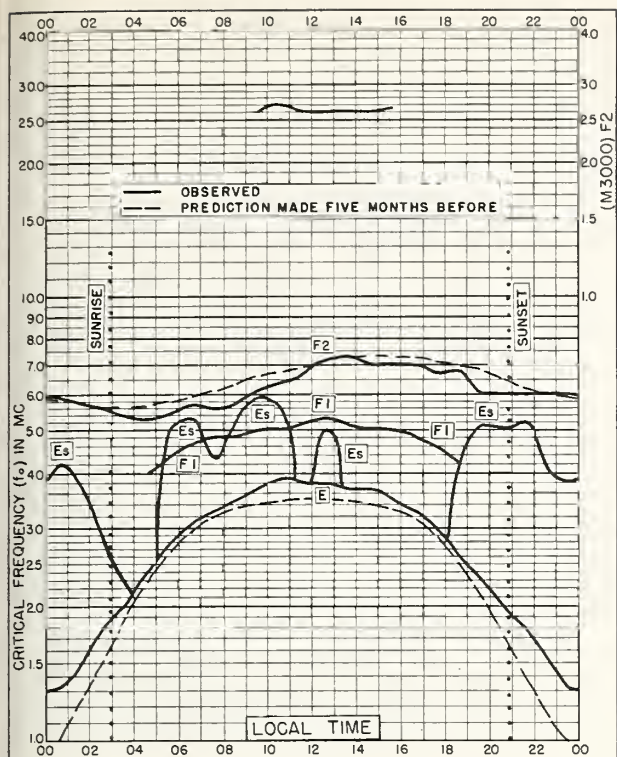


Fig. 41. BAKER LAKE, CANADA  
64.3°N, 96.0°W

MAY 1957

NBS 503

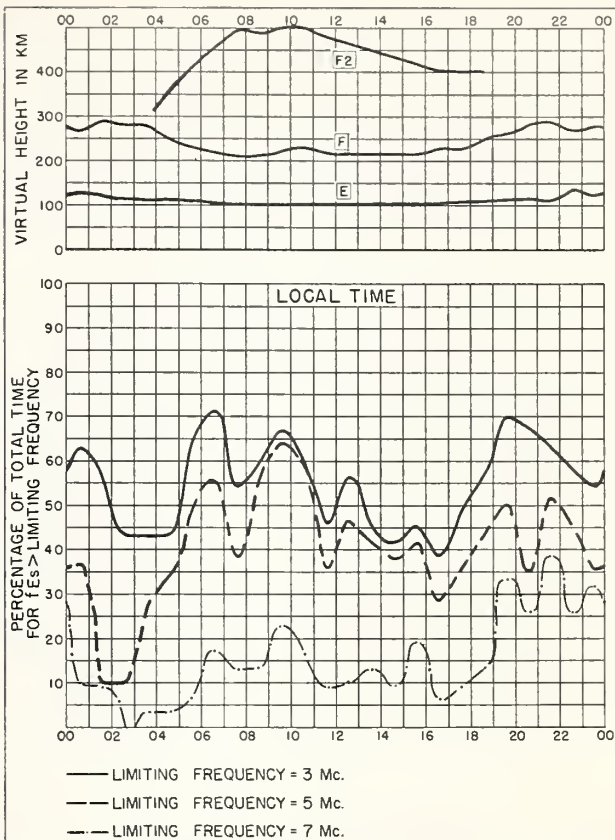


Fig. 42. BAKER LAKE, CANADA

MAY 1957

NBS 490

N. A. AIR FORCE RESEARCH OFFICE 50877

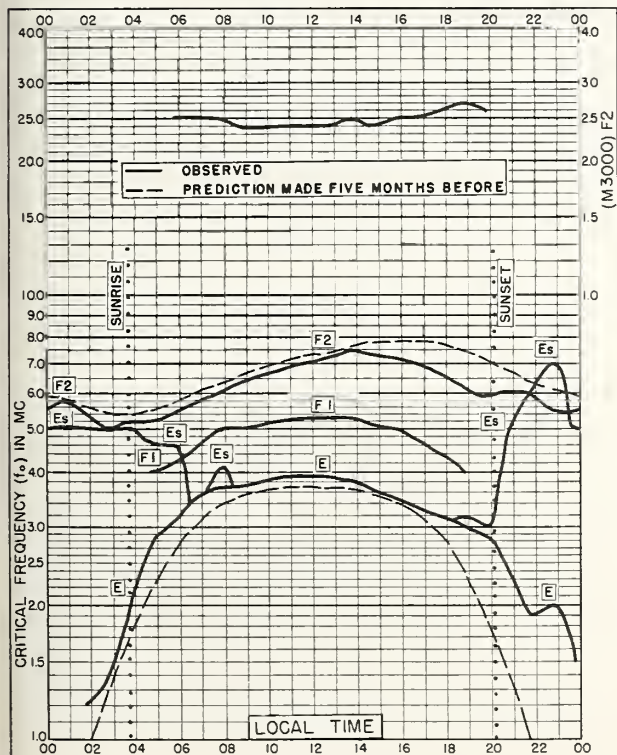


Fig. 43. CHURCHILL, CANADA  
58.8°N, 94.2°W

MAY 1957

NBS 503

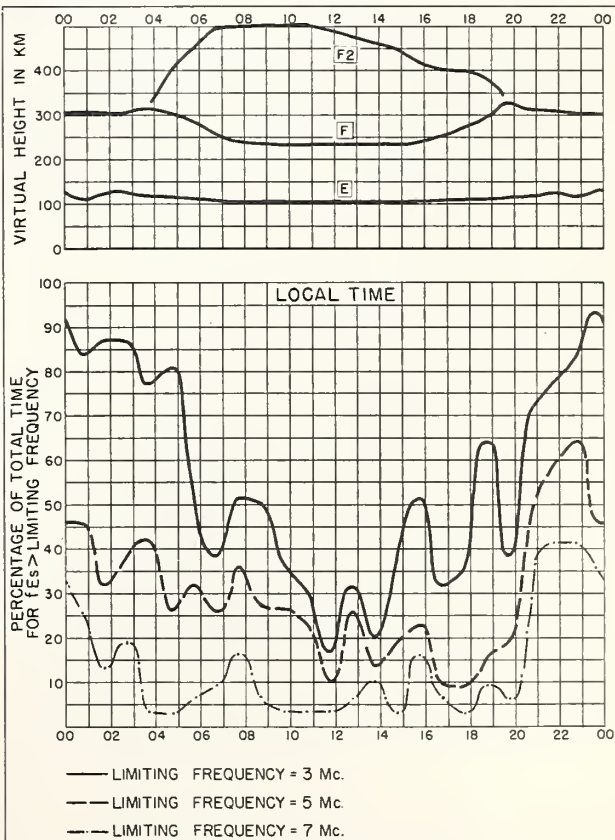


Fig. 44. CHURCHILL, CANADA

MAY 1957

NBS 490

N. A. AIR FORCE RESEARCH OFFICE 50877

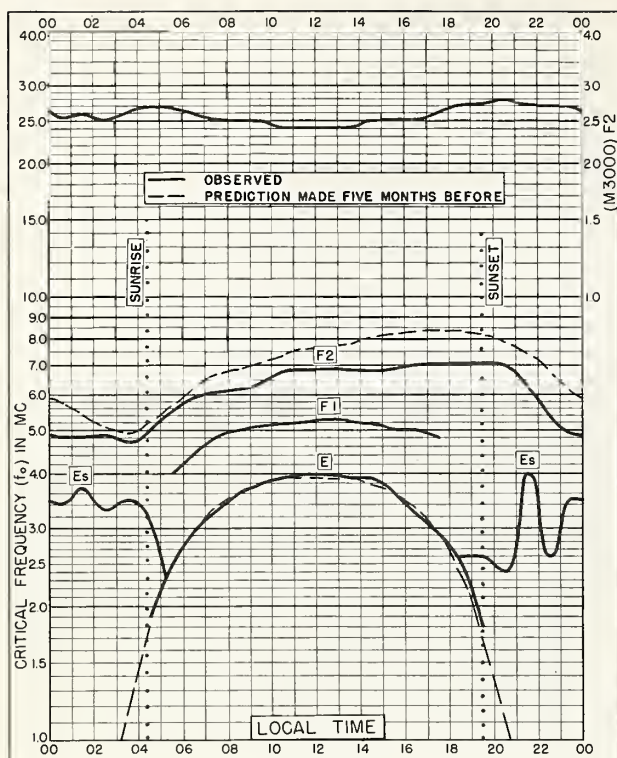


Fig. 45. WINNIPEG, CANADA  
49.9°N, 97.4°W

MAY 1957

NBS 503

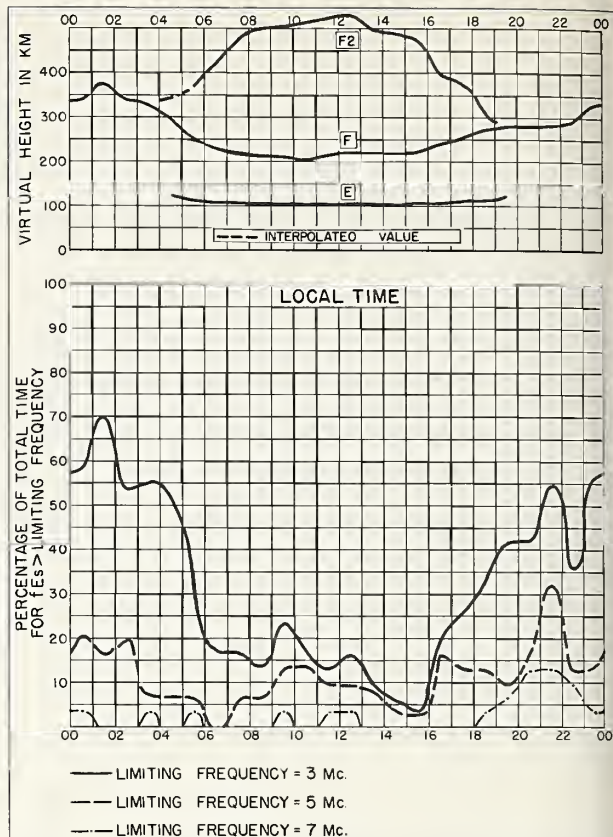


Fig. 46. WINNIPEG, CANADA

MAY 1957

NBS 490

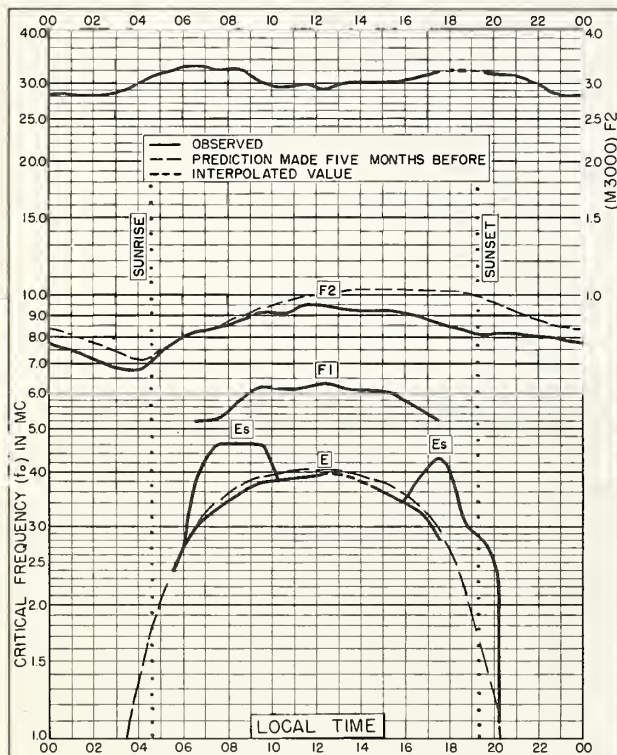


Fig. 47. SCHWARZENBURG, SWITZERLAND  
46.8°N, 7.3°E

MAY 1957

NBS 503

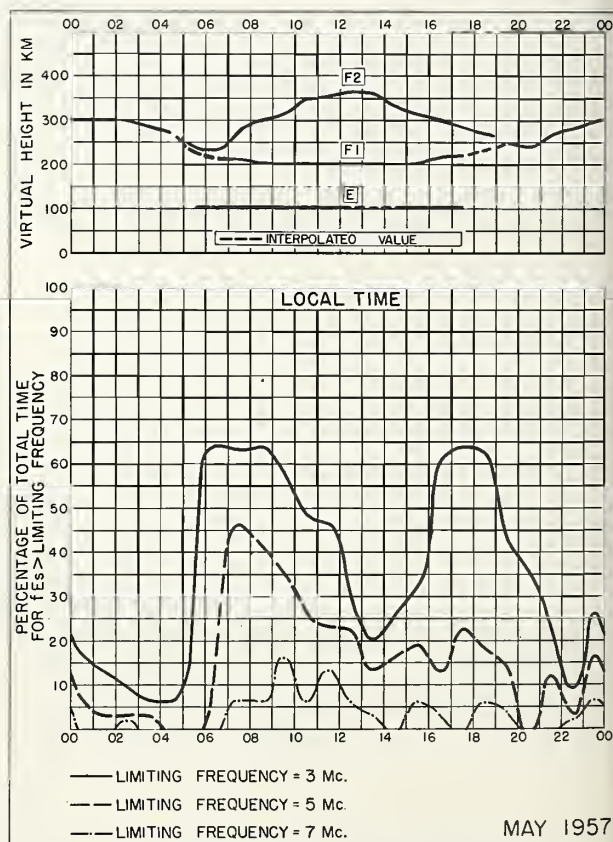


Fig. 48. SCHWARZENBURG, SWITZERLAND

MAY 1957

NBS 490

U.S. GOVERNMENT PRINTING OFFICE 137071



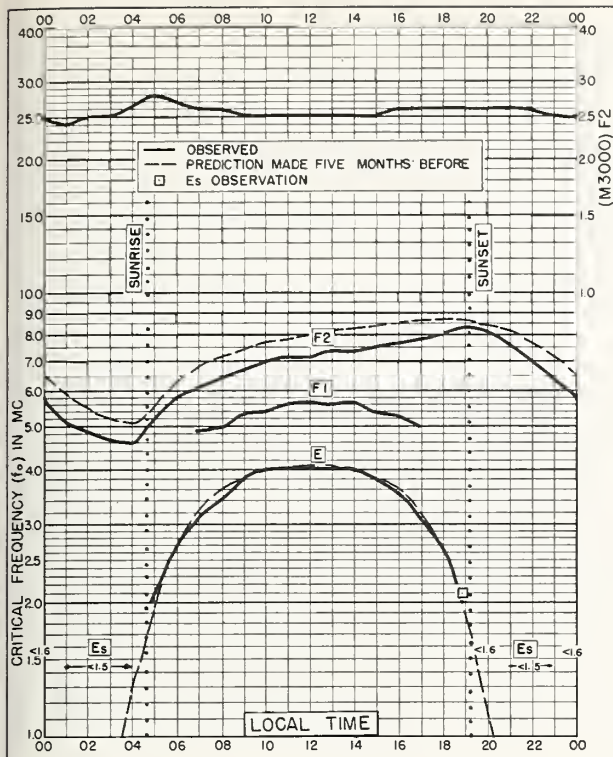


Fig. 49. OTTAWA, CANADA  
45.4°N, 75.9°W

MAY 1957

NBS 503

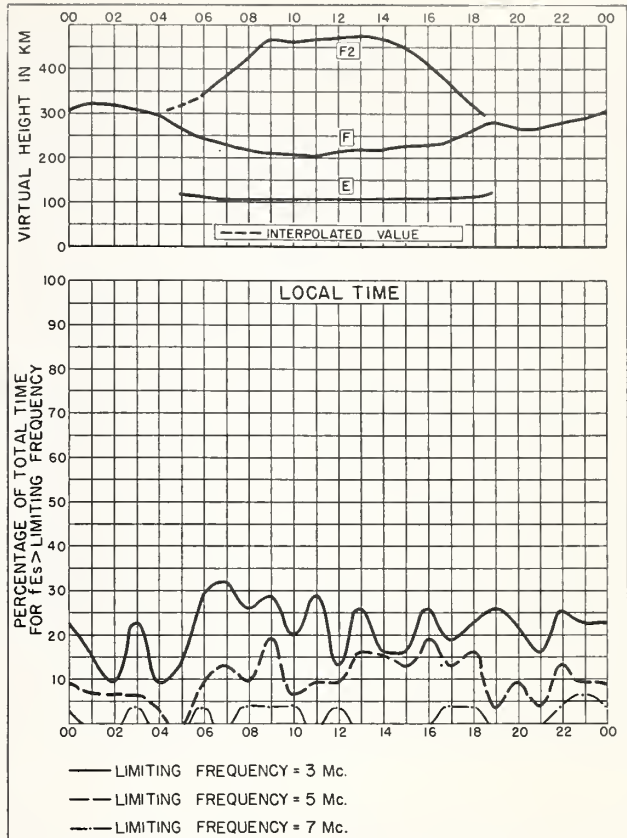


Fig. 50. OTTAWA, CANADA

MAY 1957

NBS 490

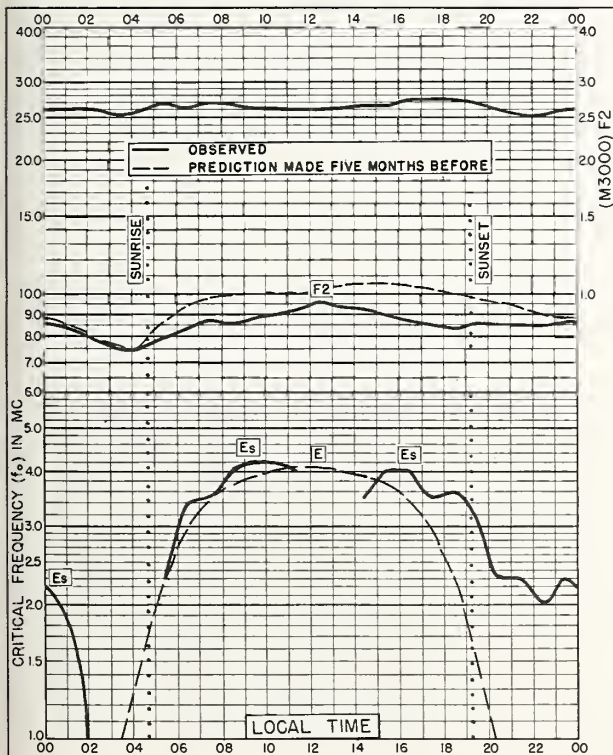


Fig. 51. WAKKANAI, JAPAN  
45.4°N, 141.7°E

MAY 1957

NBS 503

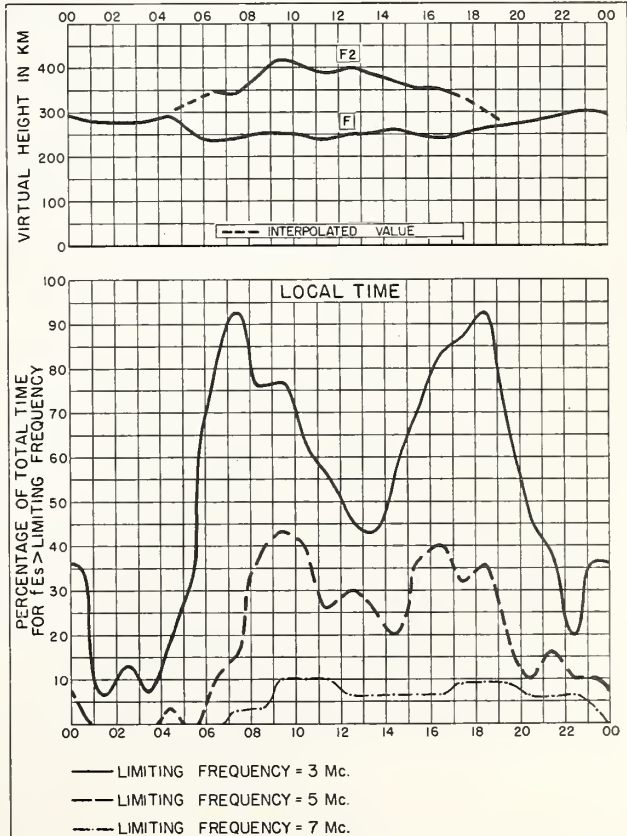


Fig. 52. WAKKANAI, JAPAN

MAY 1957

NBS 490

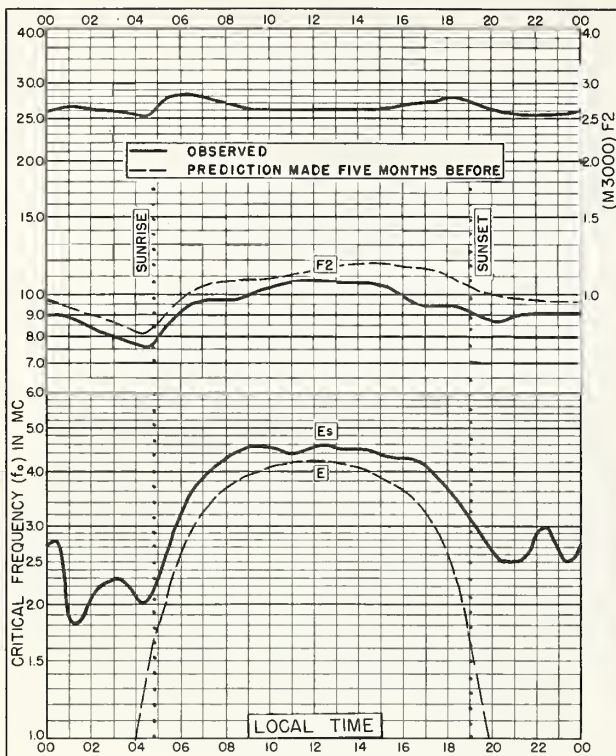


Fig. 53. AKITA, JAPAN  
39.7°N, 140.1°E

MAY 1957

NBS 505

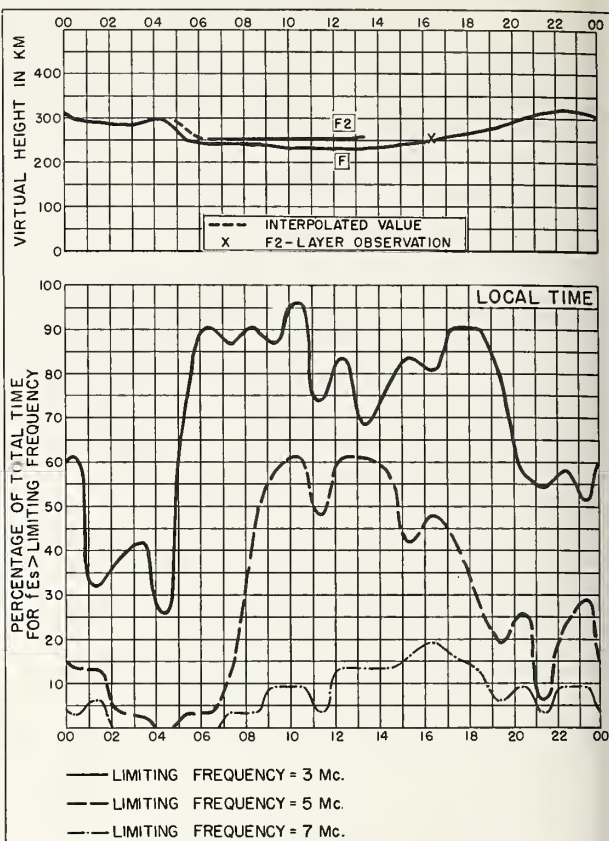


Fig. 54. AKITA, JAPAN

MAY 1957

NBS 490

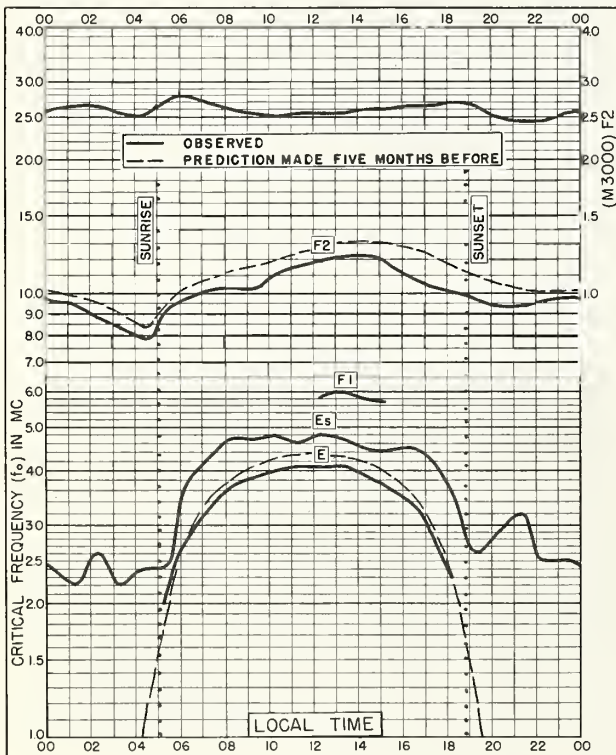


Fig. 55. TOKYO, JAPAN  
35.7°N, 139.5°E

MAY 1957

NBS 505

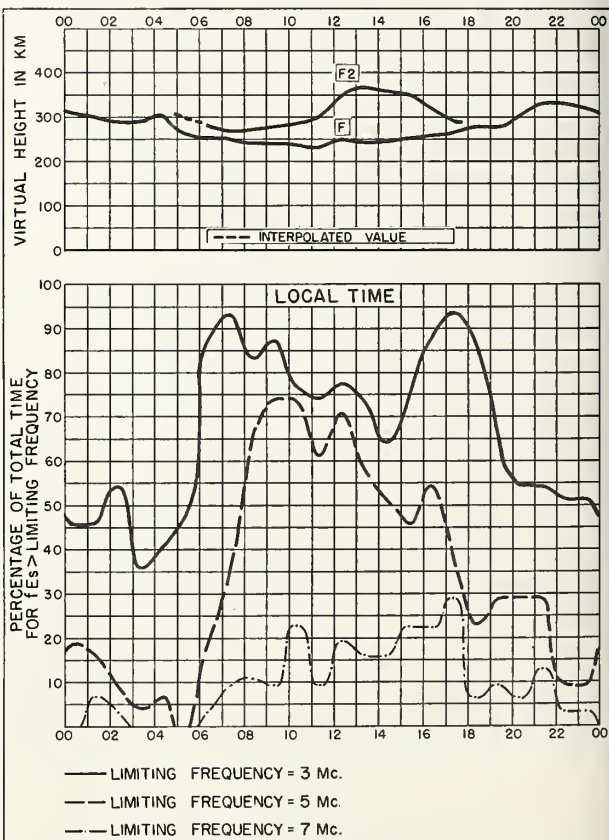


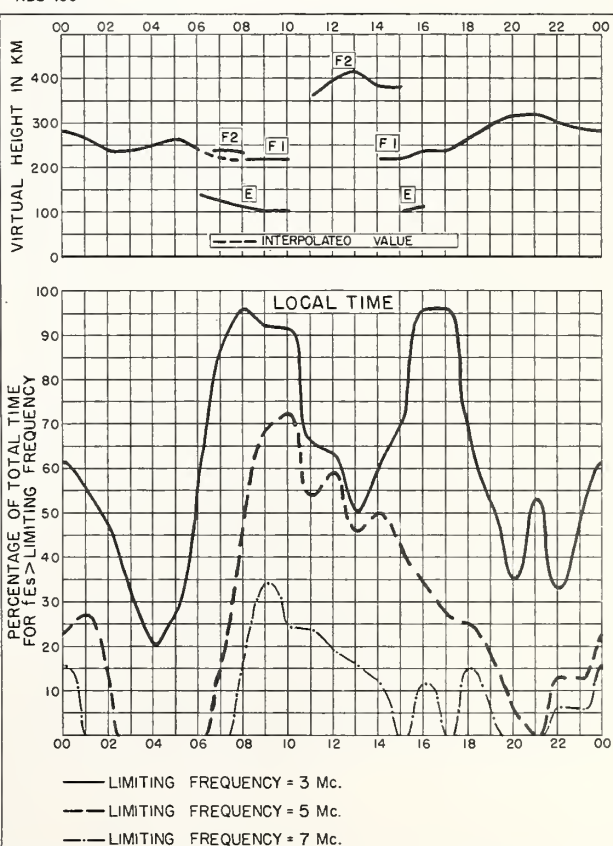
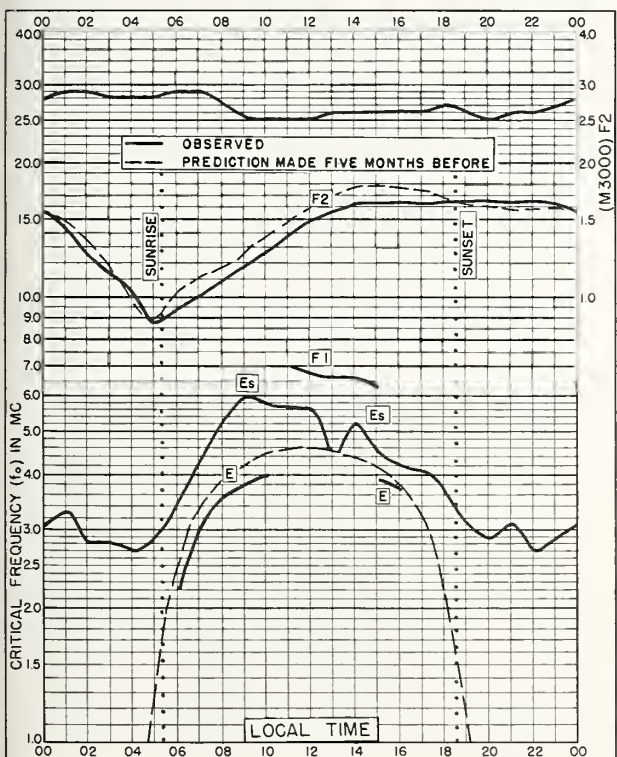
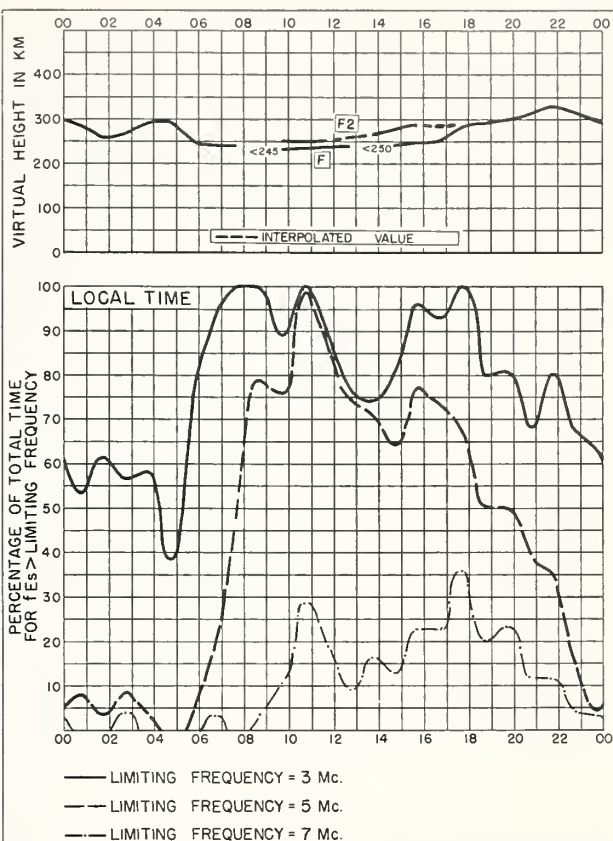
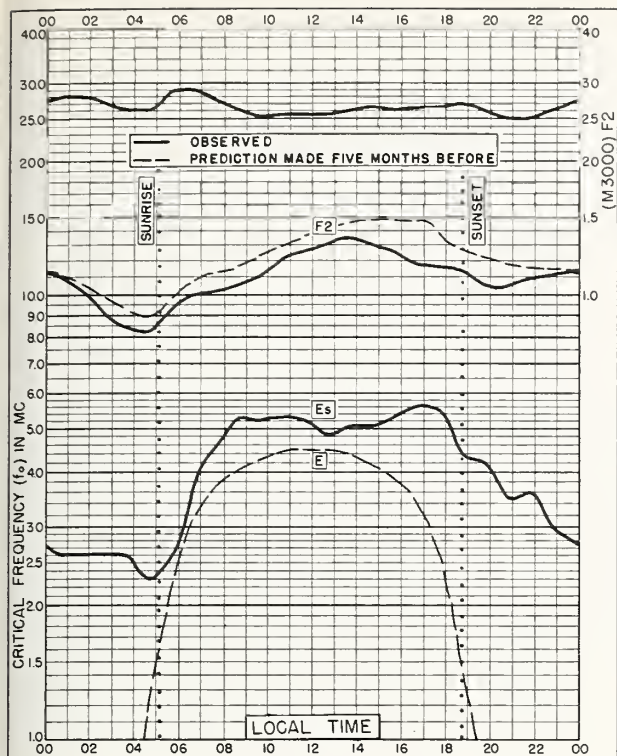
Fig. 56. TOKYO, JAPAN

MAY 1957

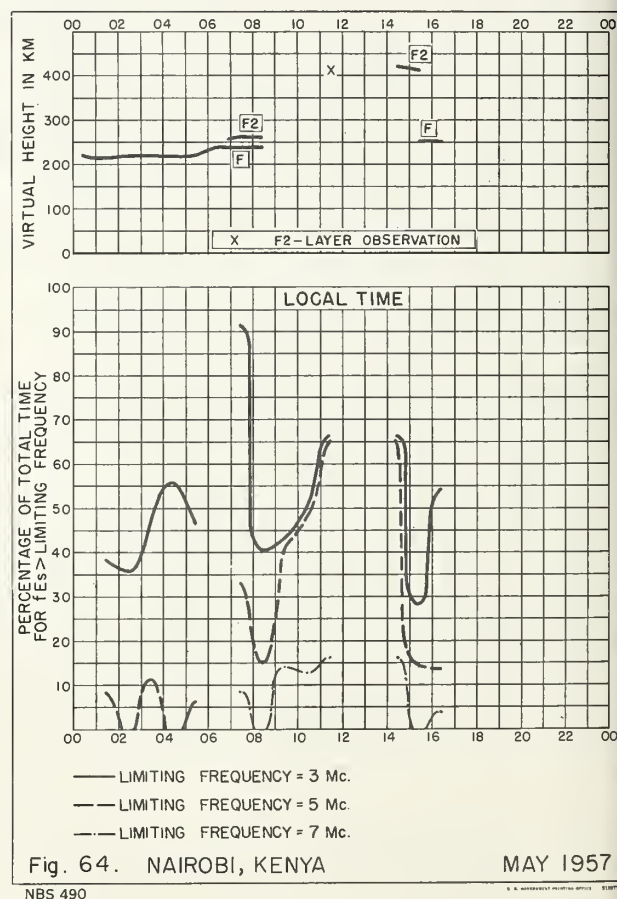
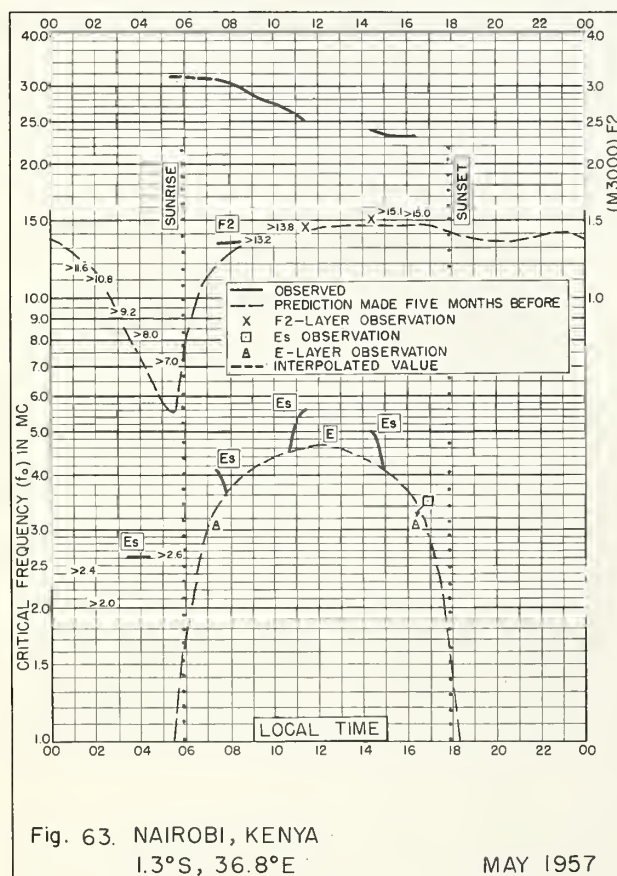
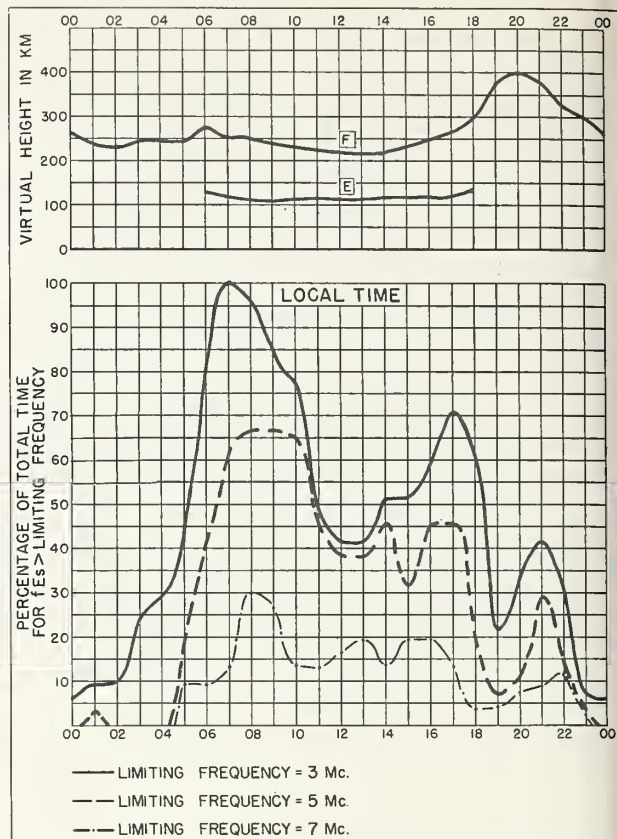
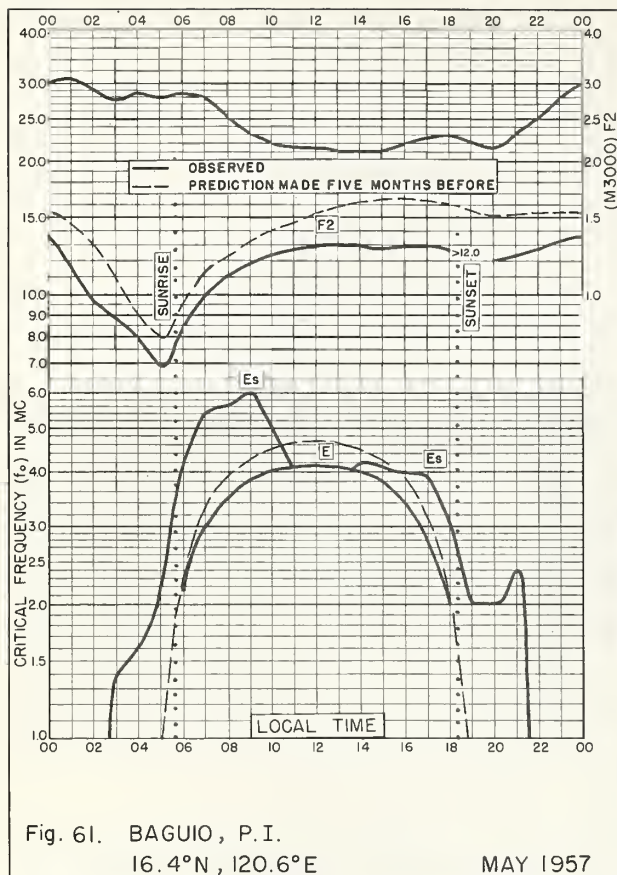
NBS 490

NBS 505









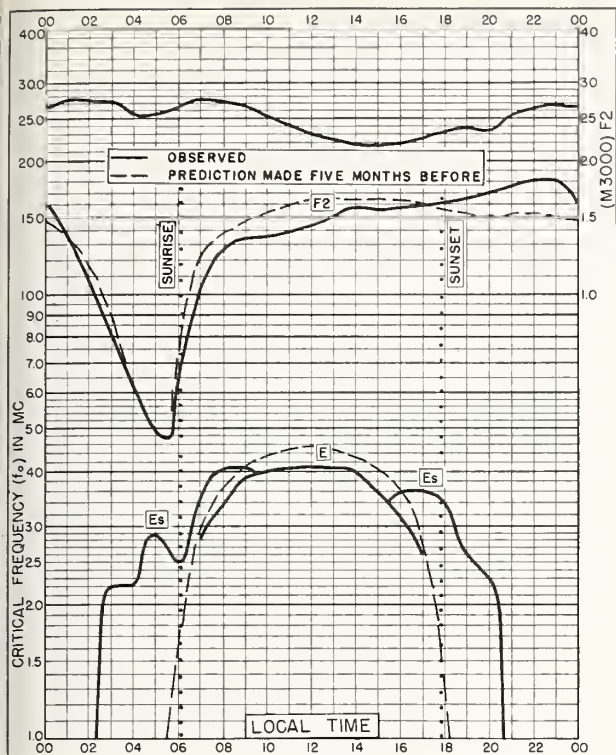


Fig. 65. LEOPOLDVILLE, BELGIAN CONGO  
4.4°S, 15.2°E  
MAY 1957

NBS 503

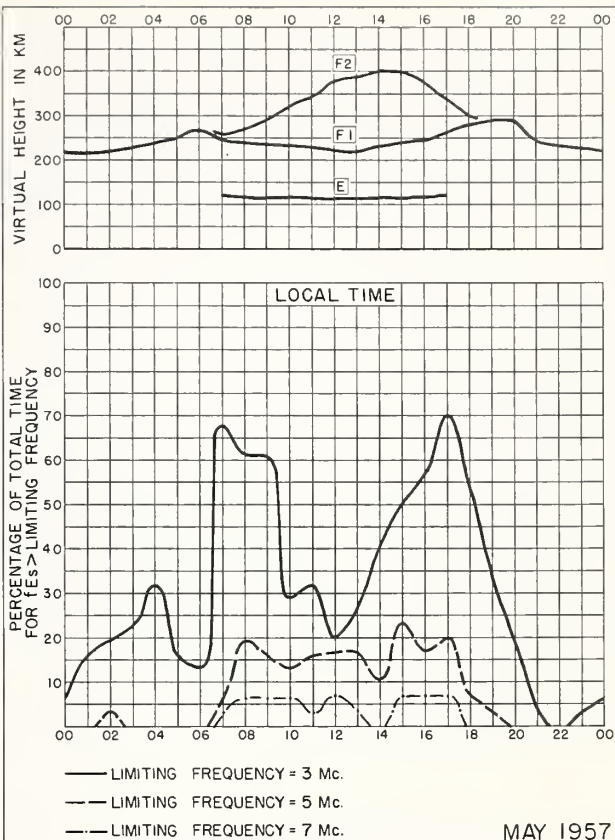


Fig. 66. LEOPOLDVILLE, BELGIAN CONGO

MAY 1957

NBS 490

NBS 490

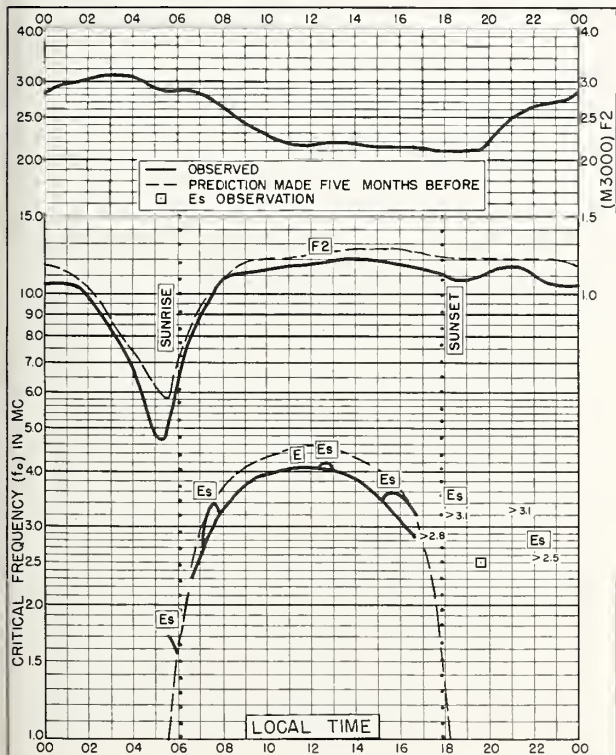


Fig. 67. TALARA, PERU  
4.6°S, 81.3°W  
MAY 1957

NBS 503

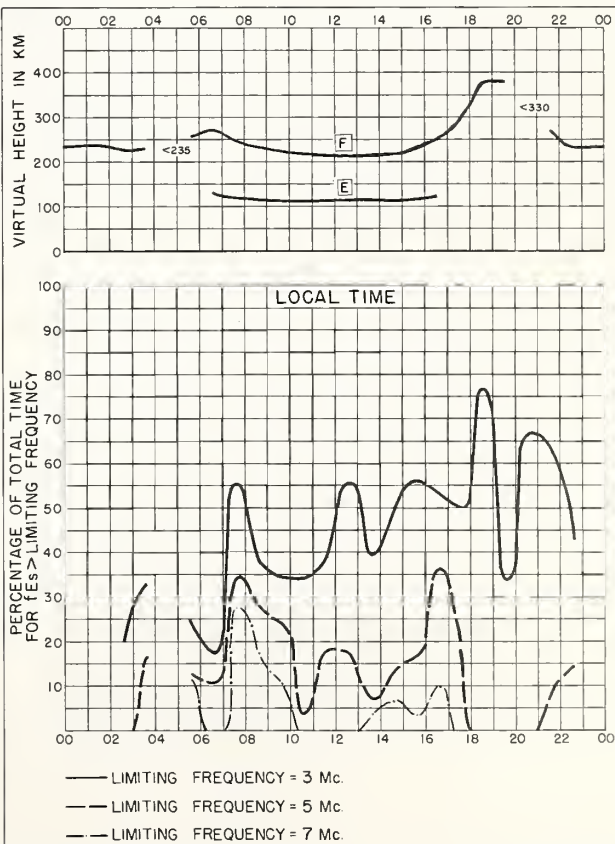


Fig. 68. TALARA, PERU

MAY 1957

NBS 490



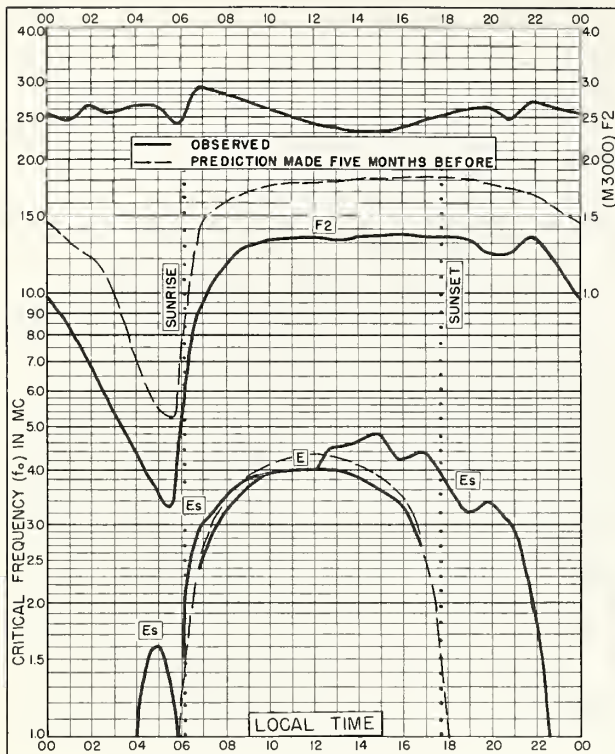


Fig. 69. ELISABETHVILLE, BELGIAN CONGO  
11.6°S, 27.5°E  
MAY 1957

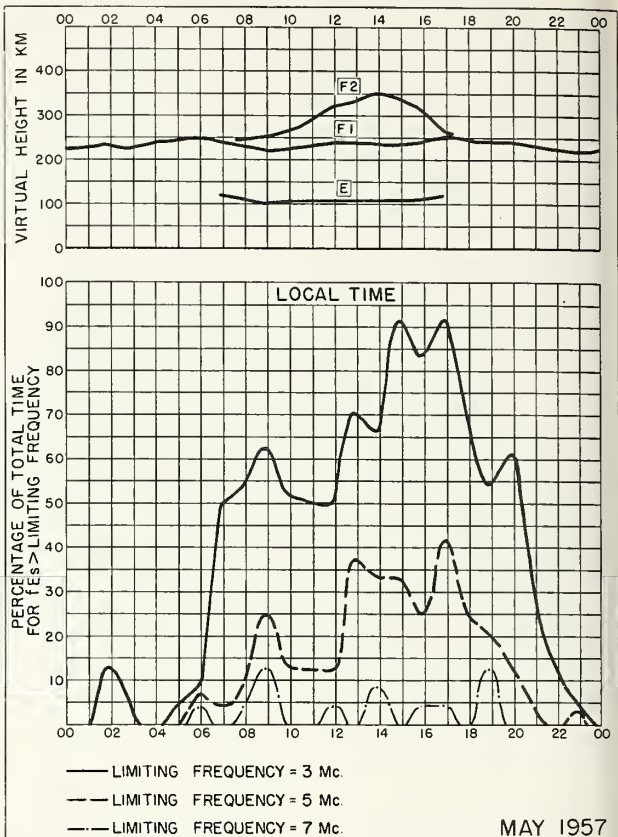


Fig. 70. ELISABETHVILLE, BELGIAN CONGO

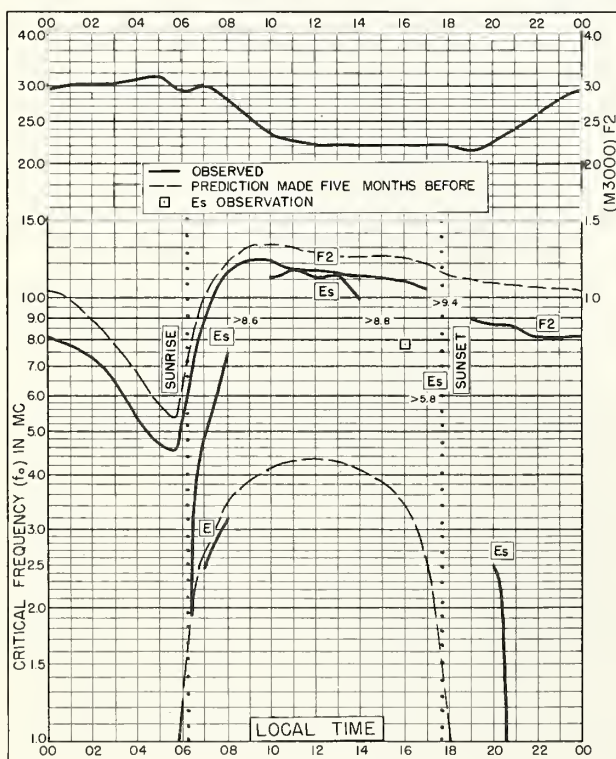


Fig. 71. HUANCAYO, PERU  
12 0°S, 75.3°W  
MAY 1957

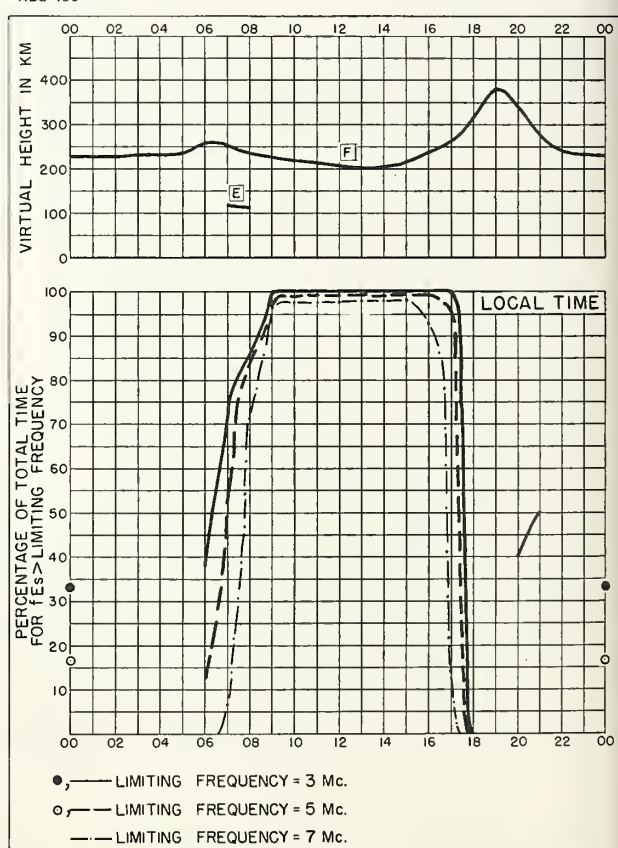


Fig. 72. HUANCAYO, PERU  
MAY 1957



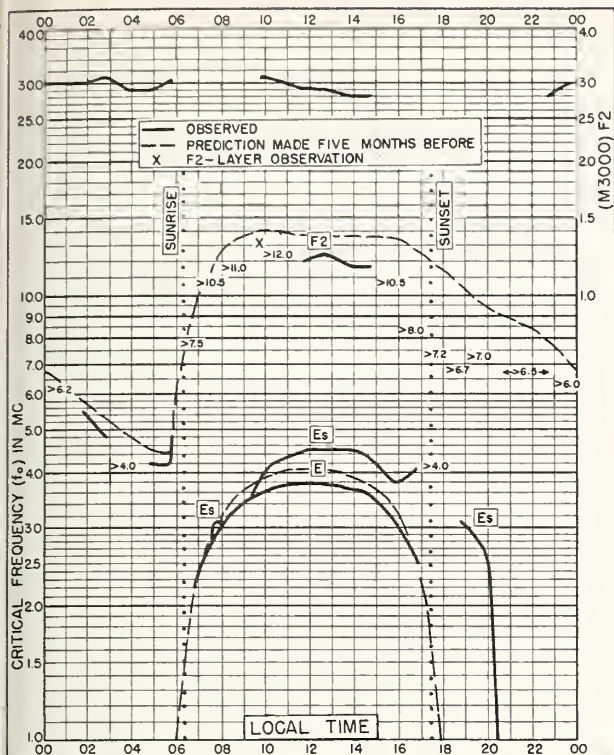


Fig. 73. TOWNVILLE, AUSTRALIA  
19.3°S, 146.7°E

MAY 1957

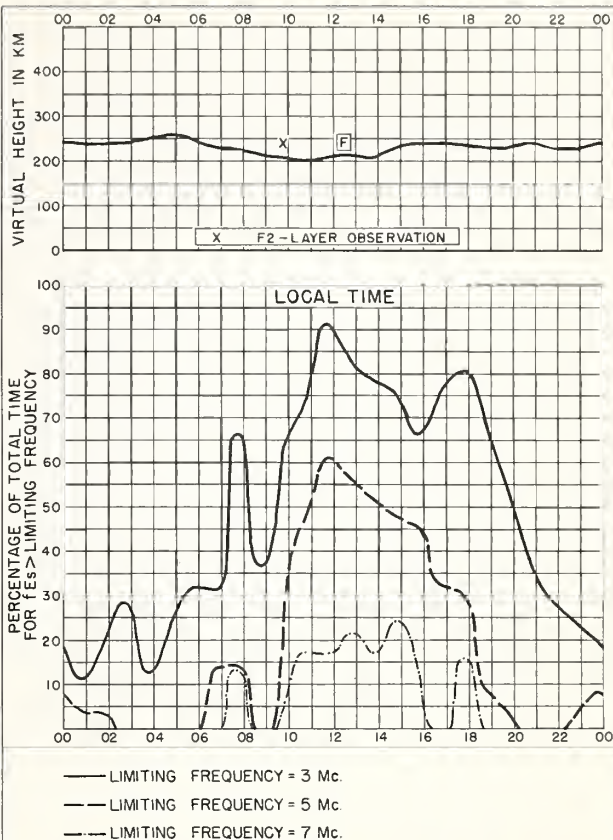


Fig. 74. TOWNVILLE, AUSTRALIA MAY 1957

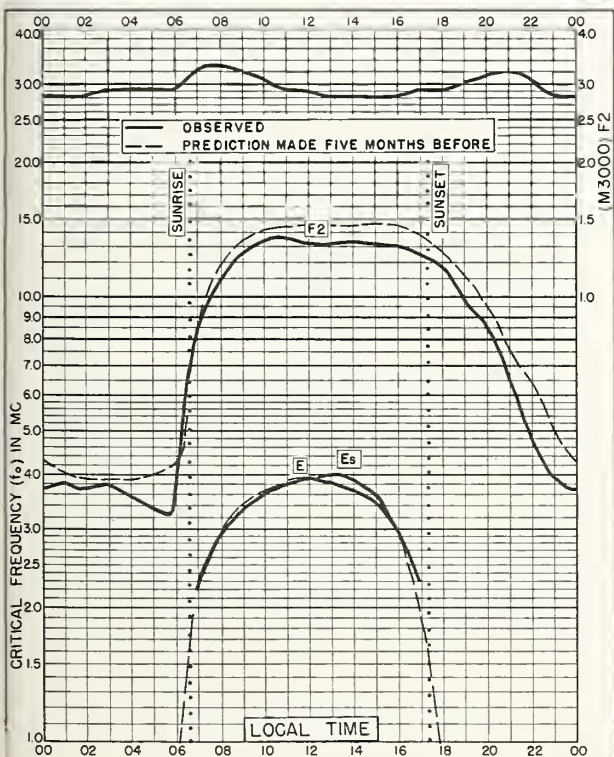


Fig. 75. JOHANNESBURG, UNION OF S. AFRICA  
26.2°S, 28.0°E

MAY 1957

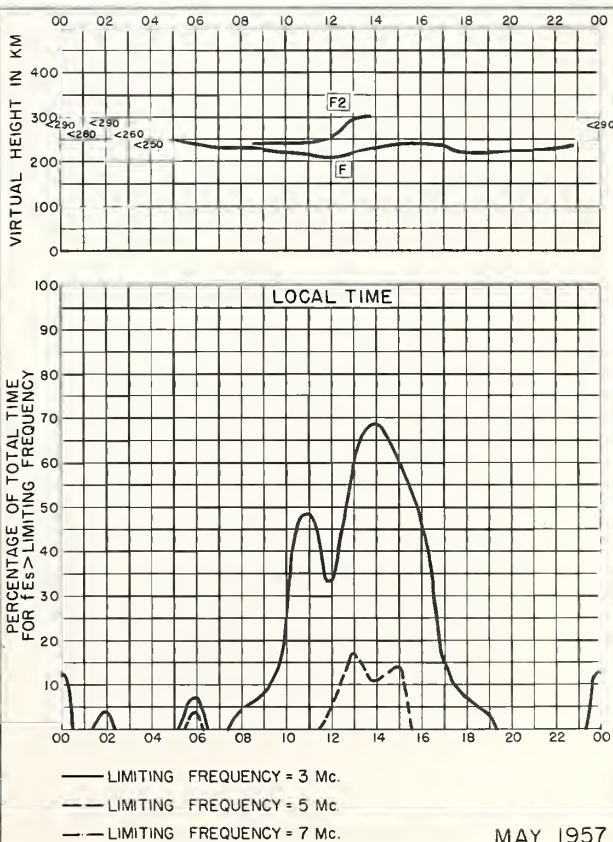


Fig. 76. JOHANNESBURG, UNION OF S. AFRICA

MAY 1957

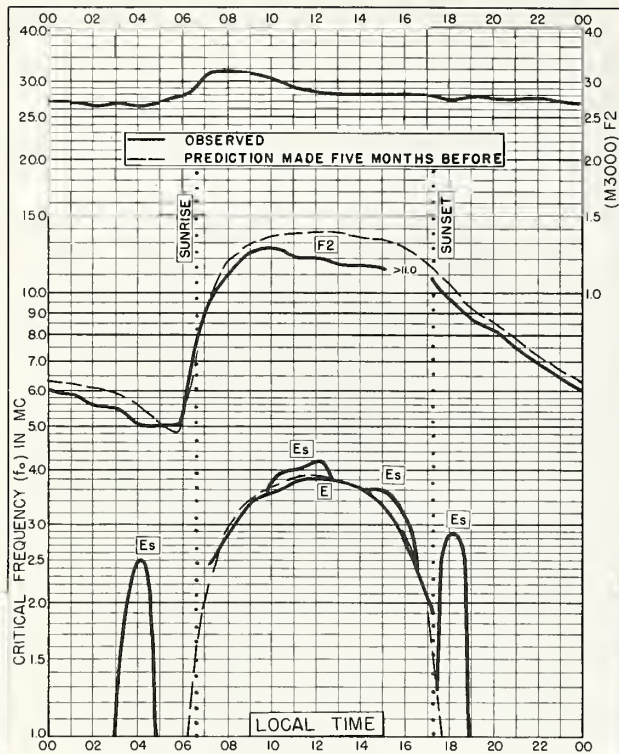


Fig. 77. BRISBANE, AUSTRALIA  
27.5°S, 152.9°E

MAY 1957

NBS 503

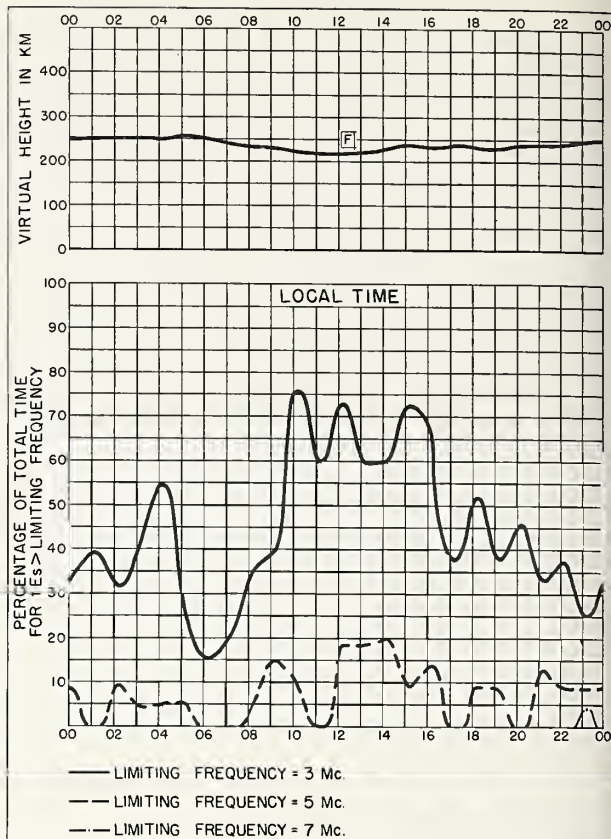


Fig. 78. BRISBANE, AUSTRALIA

MAY 1957

NBS 490

NBS 503

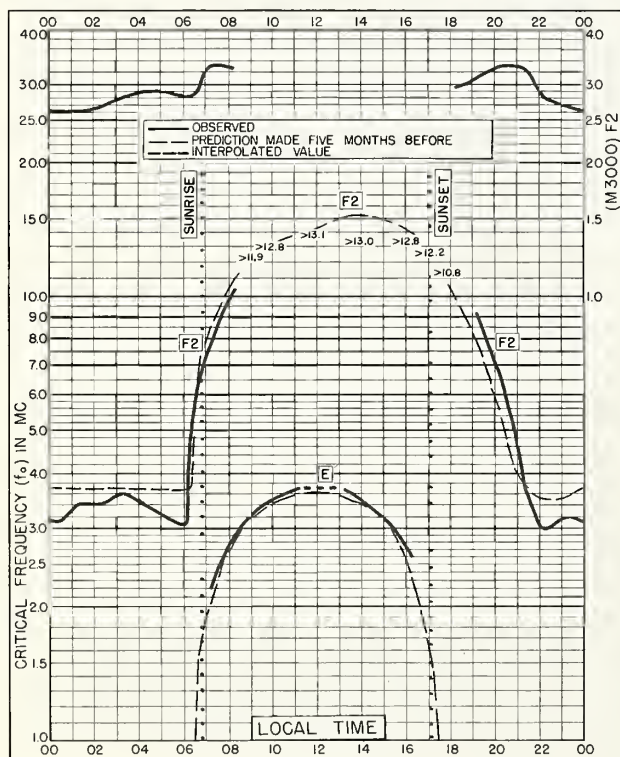


Fig. 79. CAPETOWN, UNION OF S. AFRICA  
34.1°S, 18.3°E

MAY 1957

NBS 503

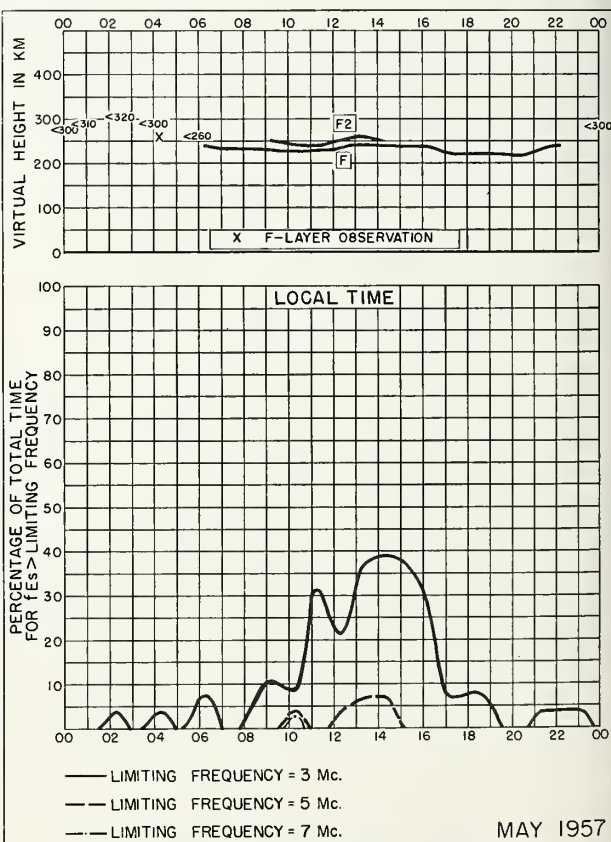


Fig. 80. CAPETOWN, UNION OF S. AFRICA

MAY 1957

NBS 490

NBS 503



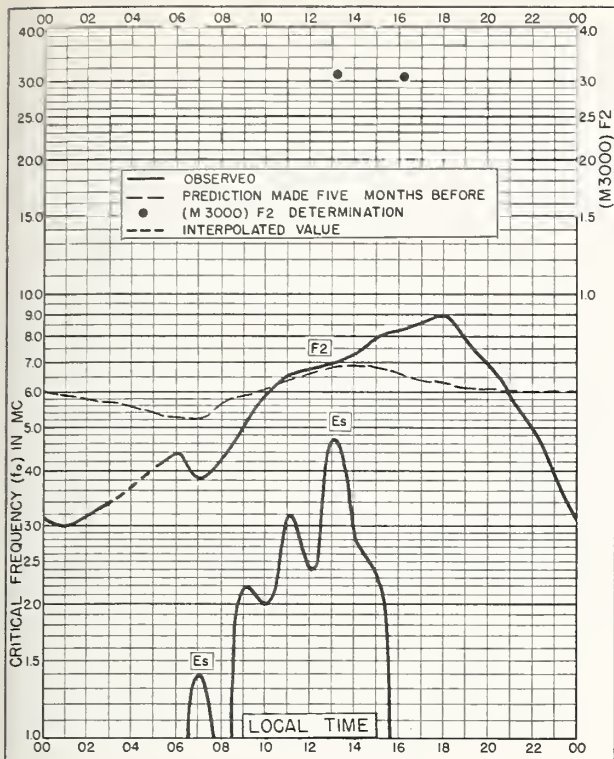


Fig. 81. SCOTT BASE  
77.8°S, 166.8°E

MAY 1957

NBS 503

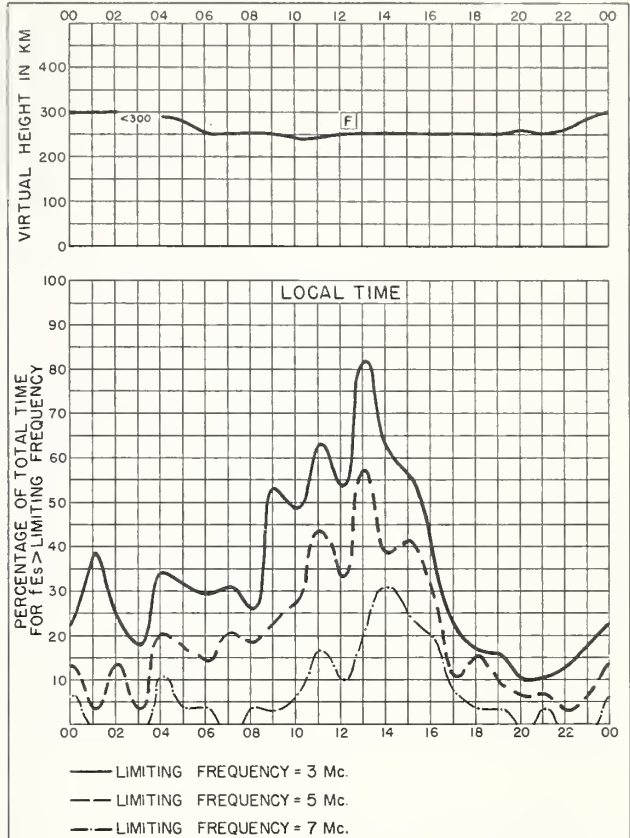


Fig. 82. SCOTT BASE

MAY 1957

NBS 490

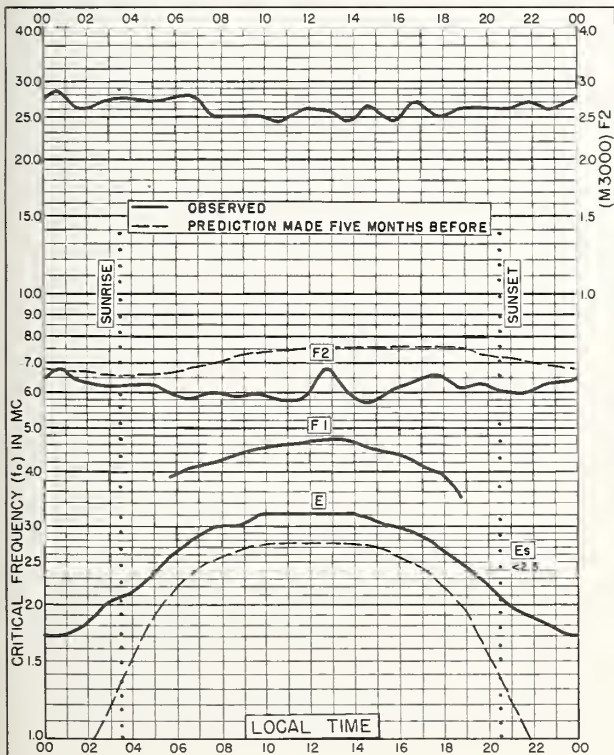


Fig. 83. RESOLUTE BAY, CANADA  
74.7°N, 94.9°W

APRIL 1957

NBS 503

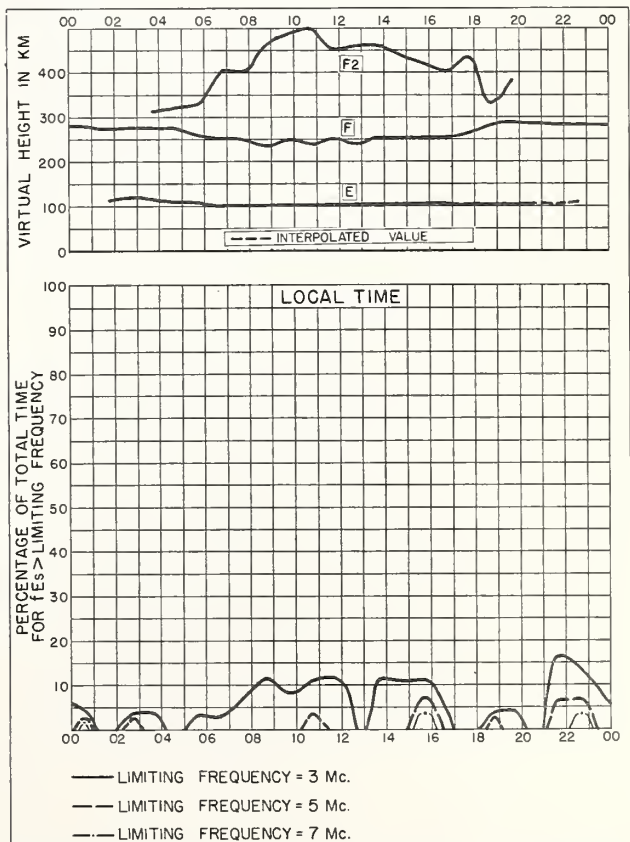


Fig. 84. RESOLUTE BAY, CANADA

APRIL 1957

NBS 490

NBS 490



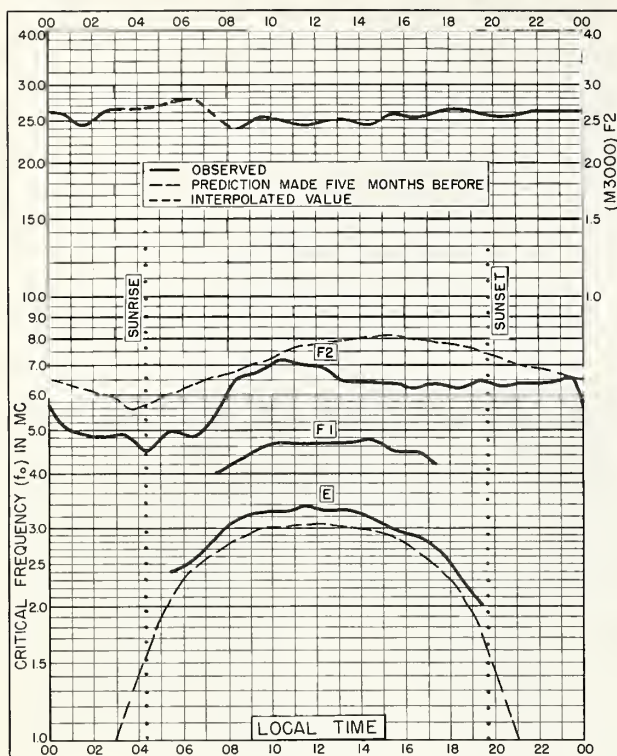


Fig. 85. GODHAVN, GREENLAND  
69.2°N, 53.5°W

APRIL 1957

NBS 503

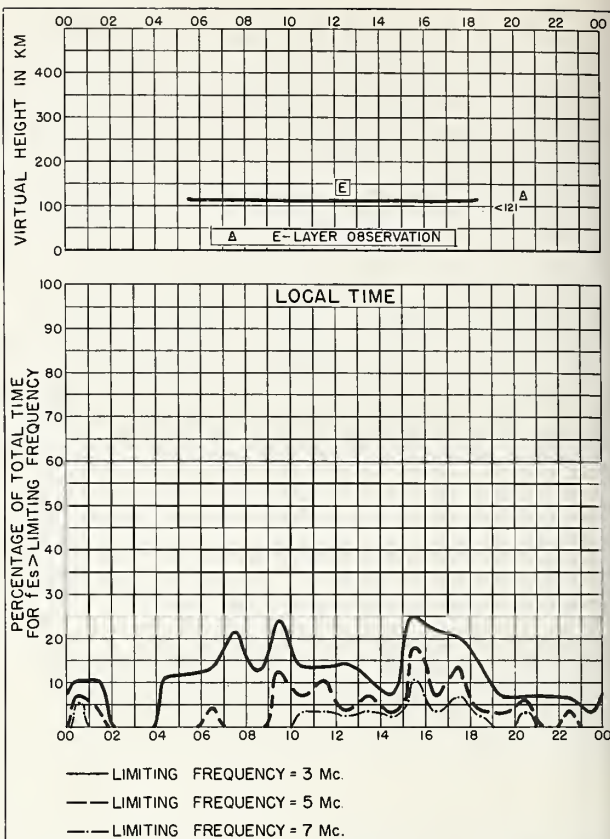


Fig. 86. GODHAVN, GREENLAND

APRIL 1957

NBS 490

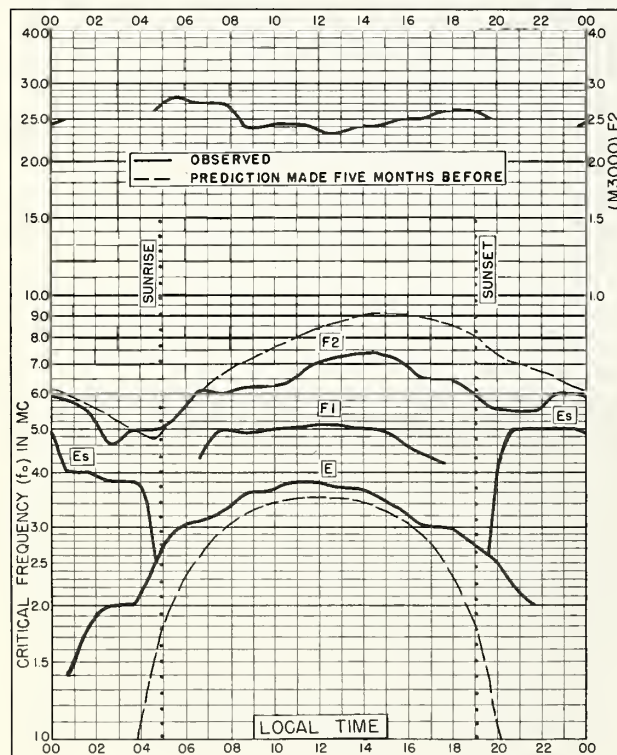


Fig. 87. CHURCHILL, CANADA  
58.8°N, 94.2°W

APRIL 1957

NBS 503

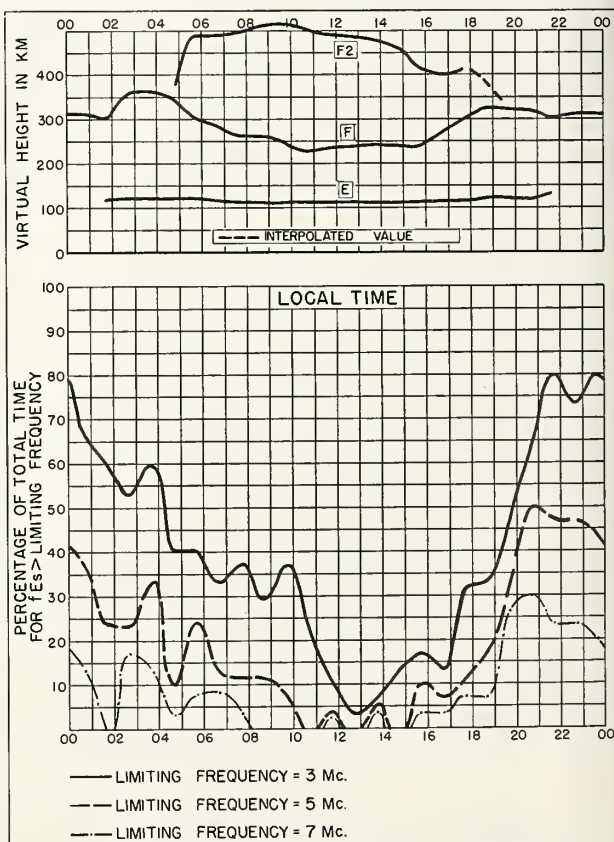


Fig. 88. CHURCHILL, CANADA

APRIL 1957

NBS 490

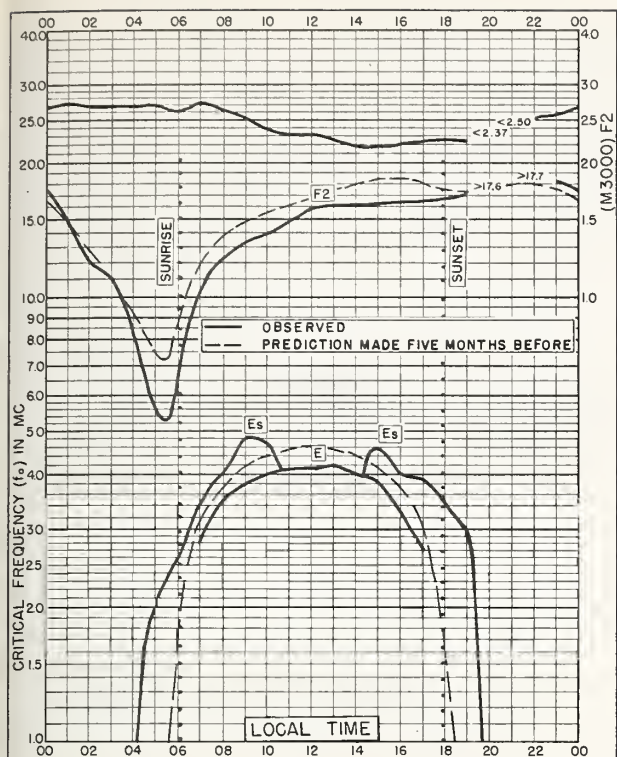


Fig. 89. LEOPOLDVILLE, BELGIAN CONGO  
4.4°S, 15.2°E  
APRIL 1957

NBS 503

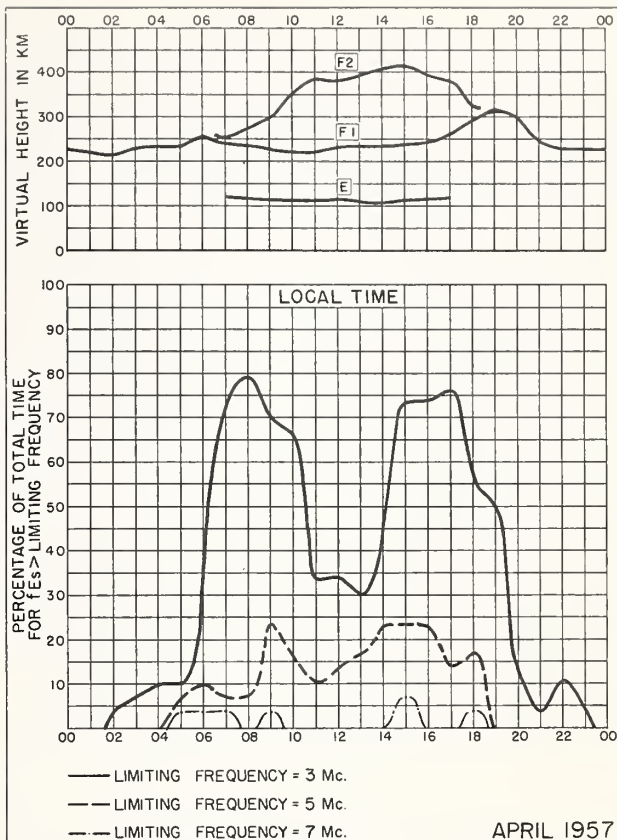


Fig. 90. LEOPOLDVILLE, BELGIAN CONGO

APRIL 1957

NBS 490

U. S. GOVERNMENT PRINTING OFFICE 313277

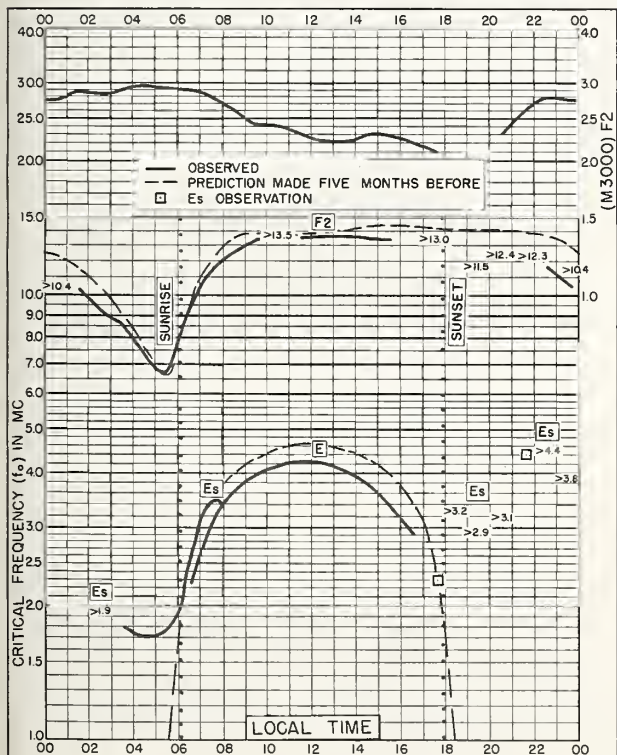


Fig. 91. TALARA, PERU  
4.6°S, 81.3°W  
APRIL 1957

NBS 503

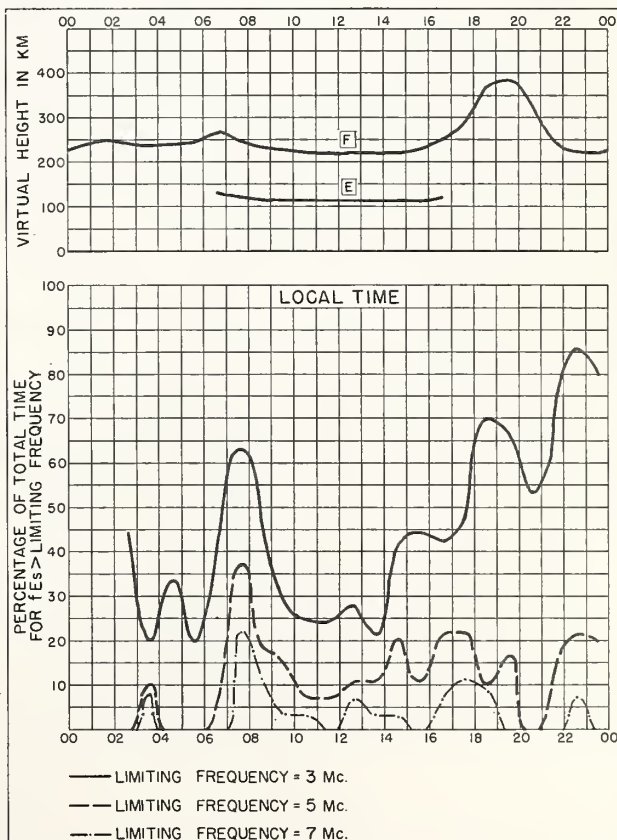


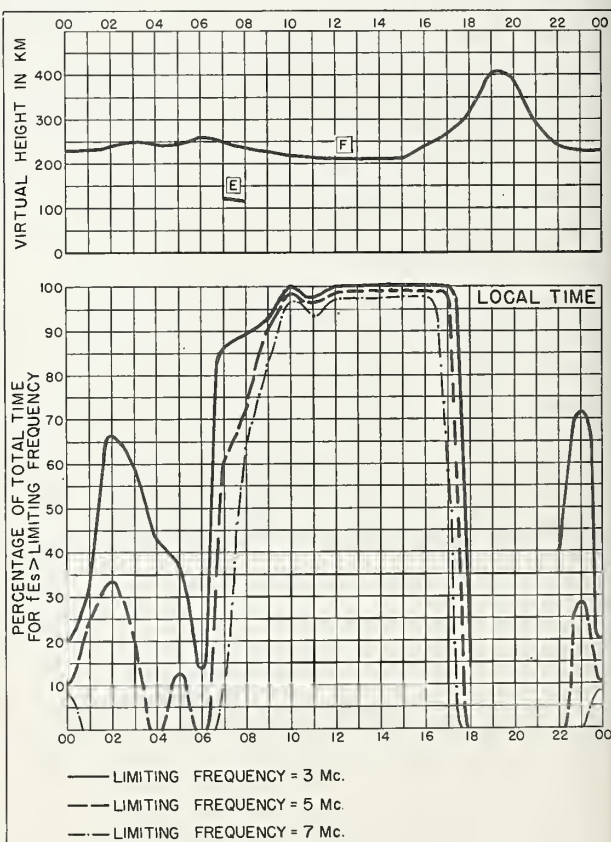
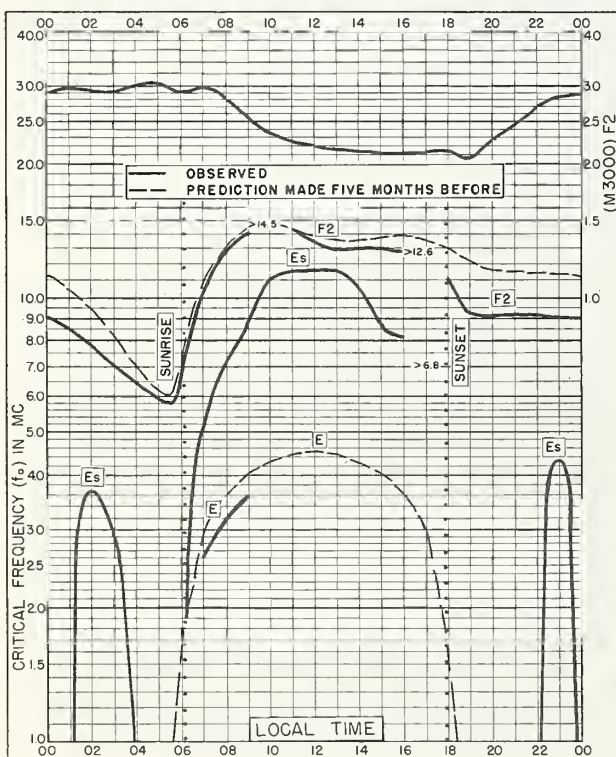
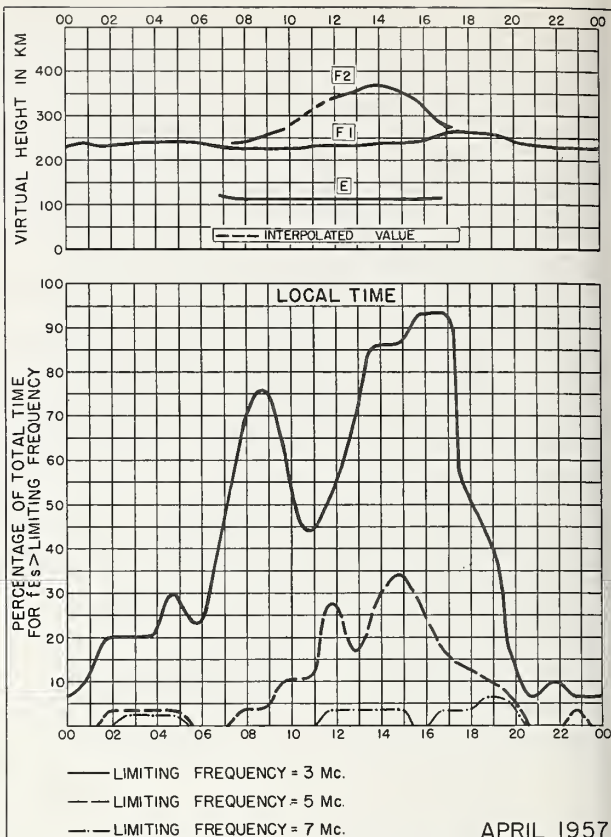
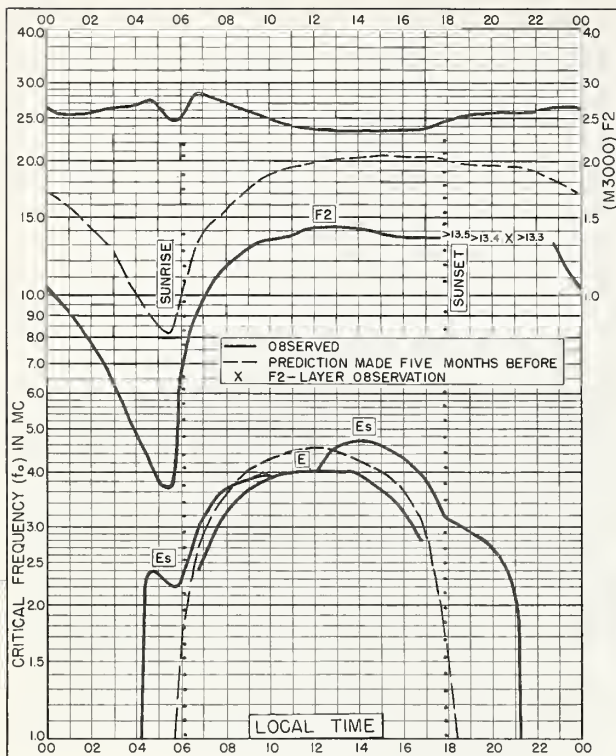
Fig. 92. TALARA, PERU

APRIL 1957

NBS 490

U. S. GOVERNMENT PRINTING OFFICE 313277







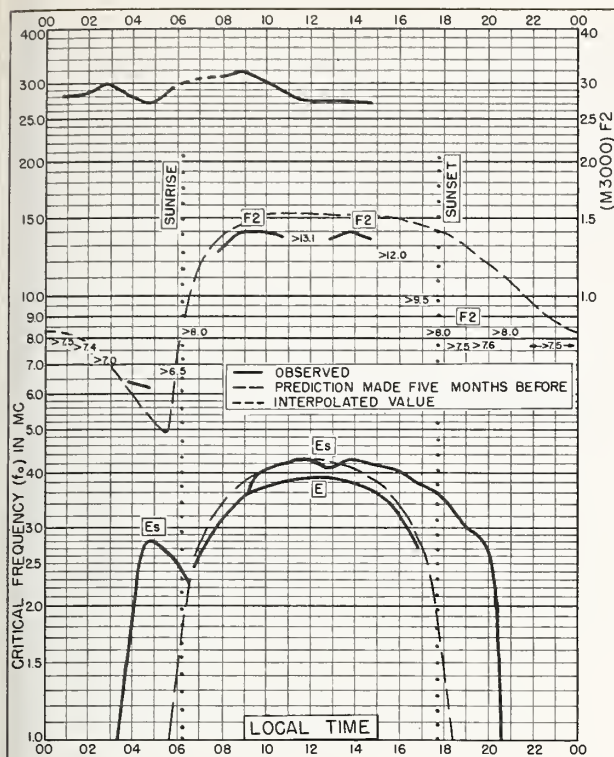


Fig. 97. TOWNSVILLE, AUSTRALIA  
19.3°S, 146.7°E

APRIL 1957

NBS 503

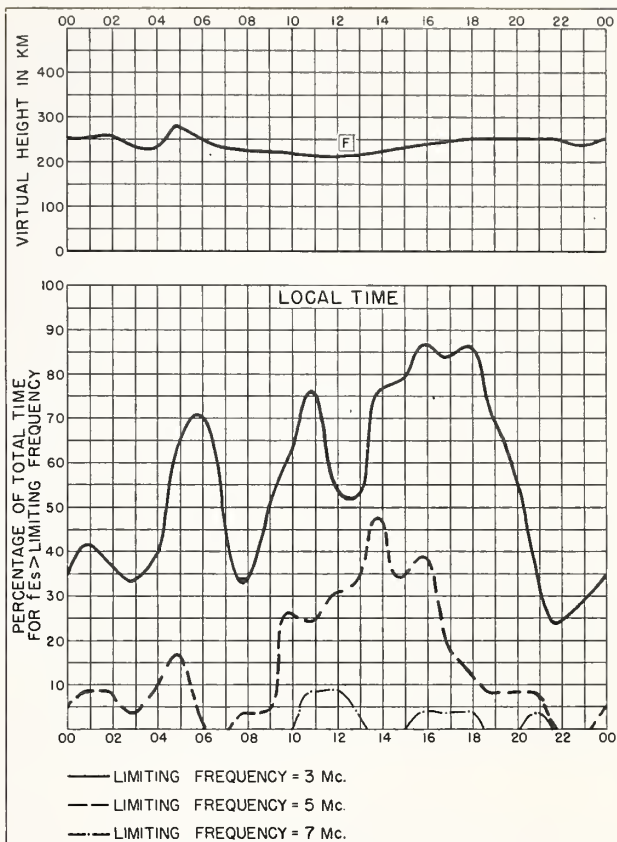


Fig. 98. TOWNSVILLE, AUSTRALIA

APRIL 1957

NBS 490

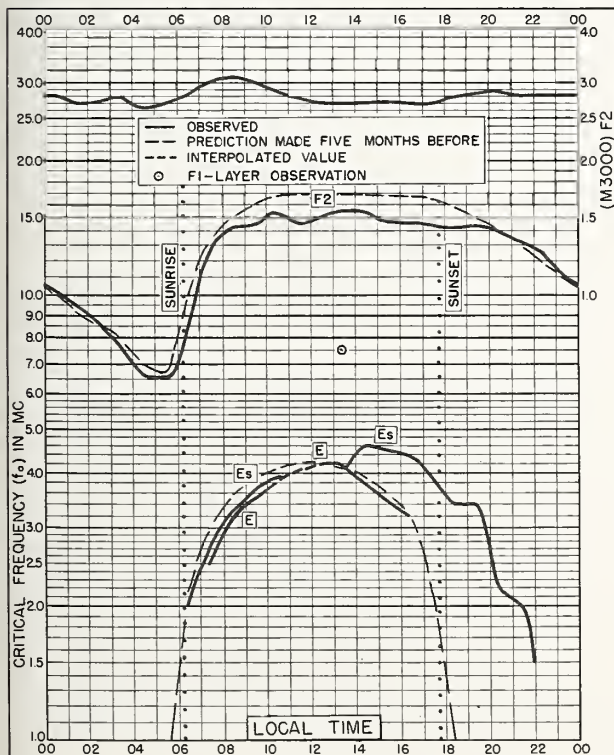


Fig. 99. RAROTONGA I.  
21.2°S, 159.8°W

APRIL 1957

NBS 503

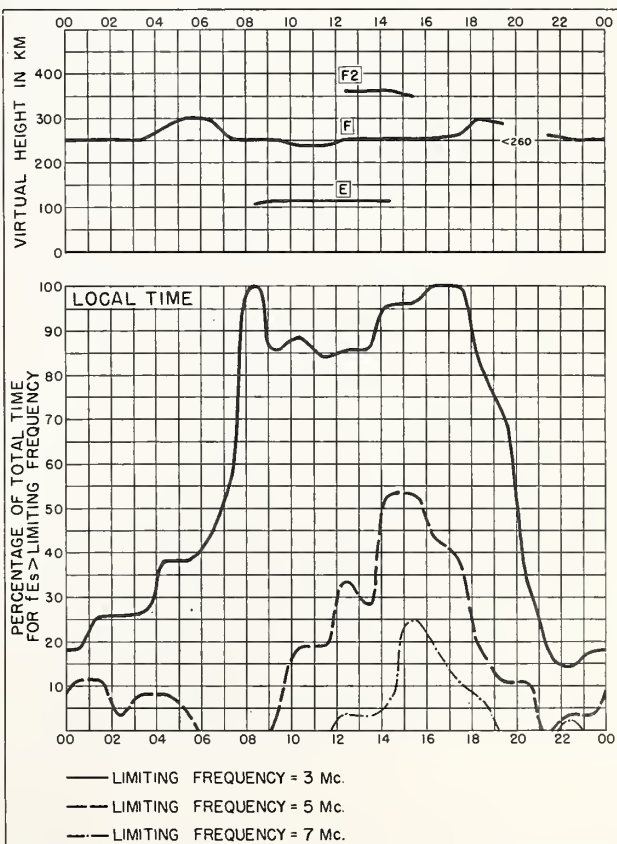


Fig. 100. RAROTONGA I.

APRIL 1957

NBS 490

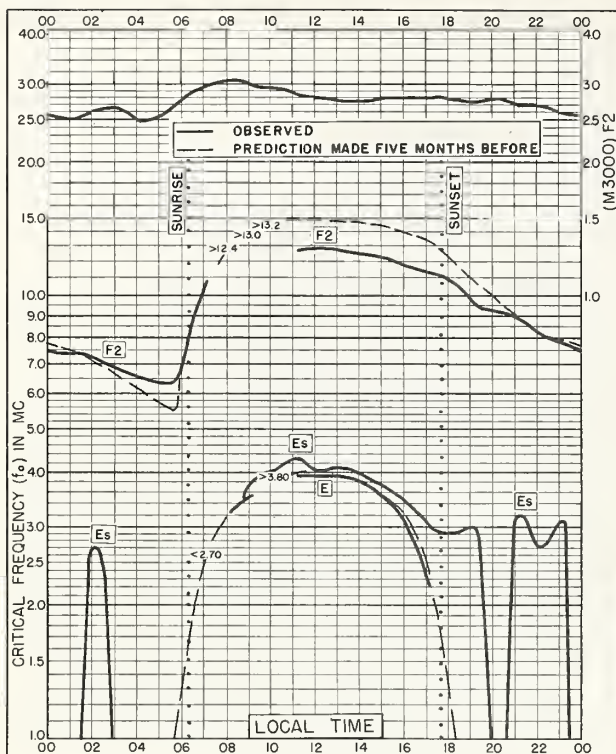


Fig. 101. BRISBANE, AUSTRALIA  
27.5°S, 152.9°E

APRIL 1957

NBS 503

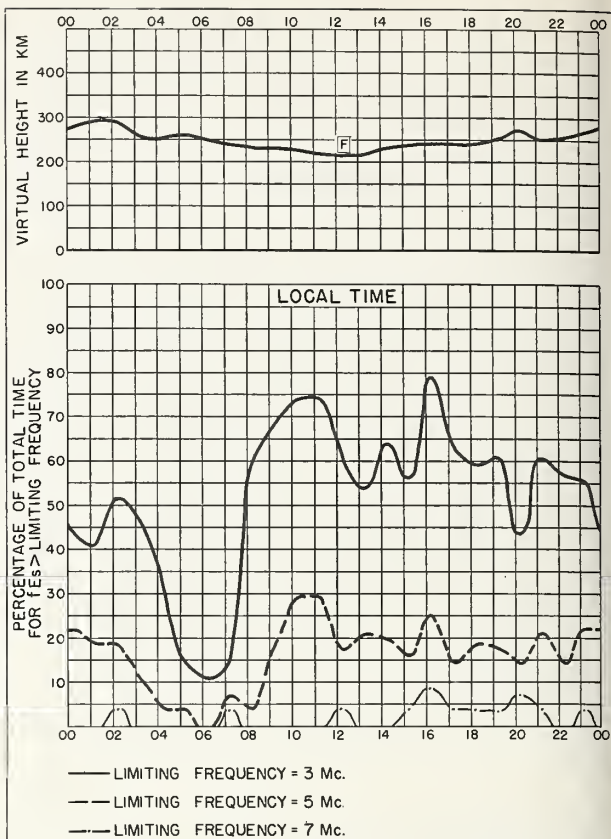


Fig. 102. BRISBANE, AUSTRALIA

APRIL 1957

NBS 490

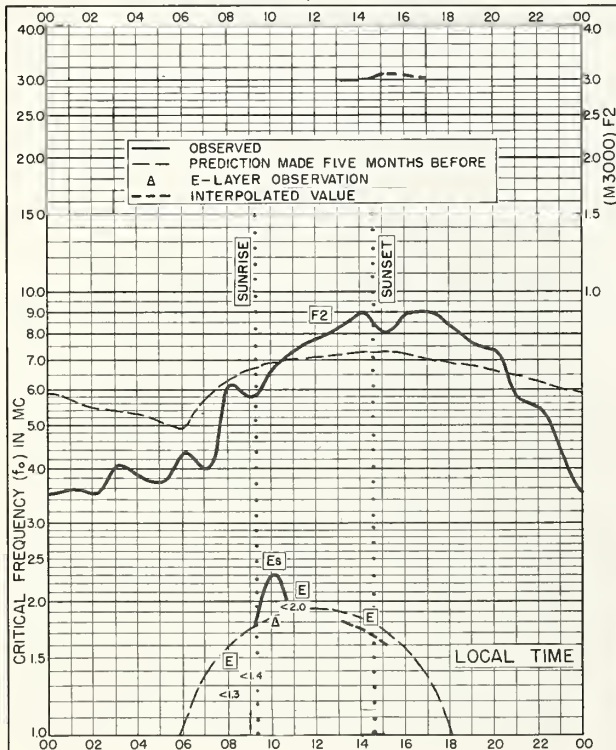


Fig. 103. SCOTT BASE  
77.8°S, 166.8°E

APRIL 1957

NBS 503

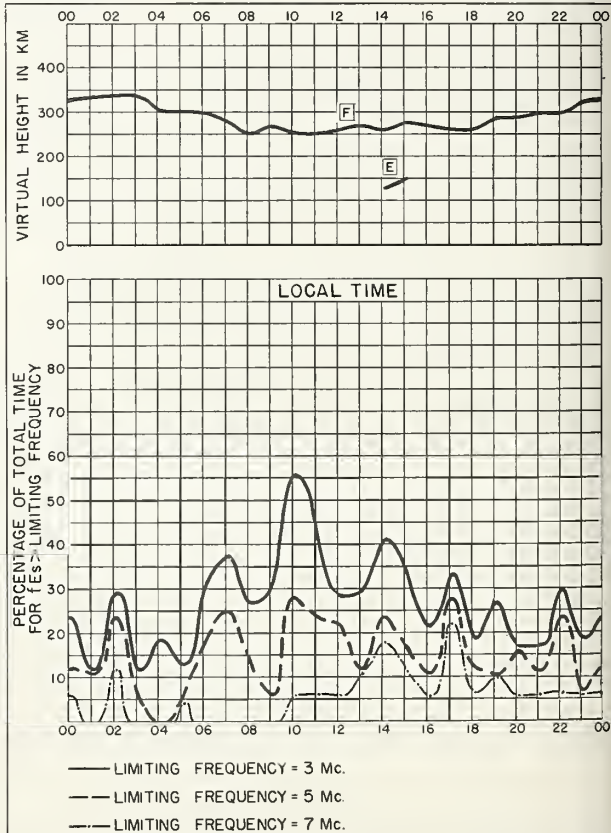


Fig. 104. SCOTT BASE

APRIL 1957

NBS 490

NBS 490



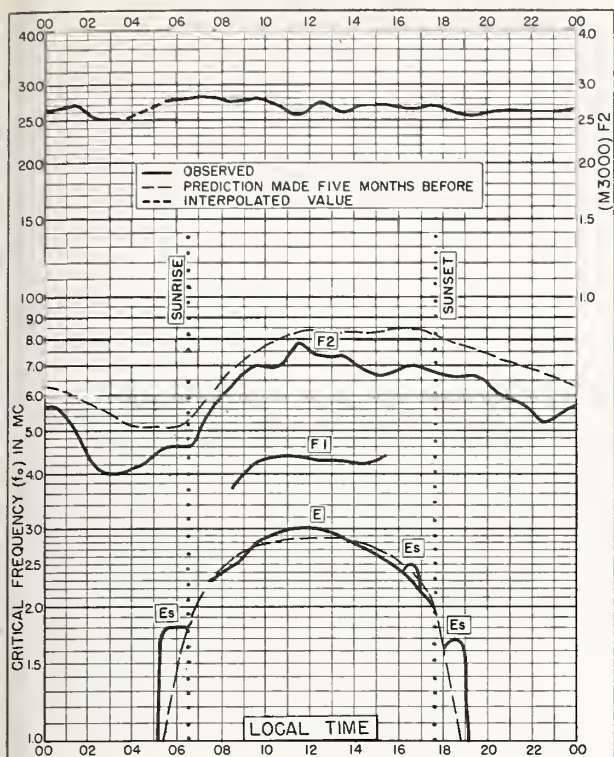


Fig. 105. GODHAVN, GREENLAND  
69.2°N, 53.5°W

MARCH 1957

NBS 503

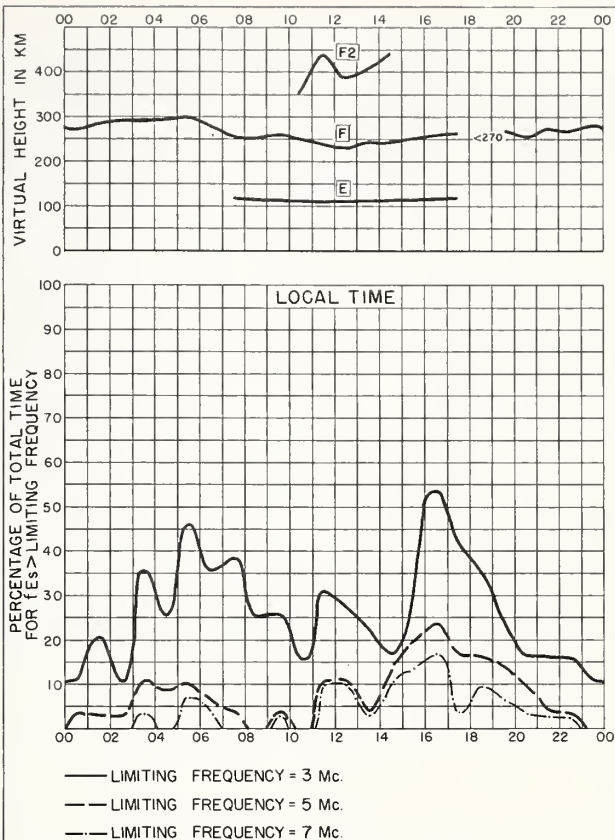


Fig. 106. GODHAVN, GREENLAND

MARCH 1957

NBS 490

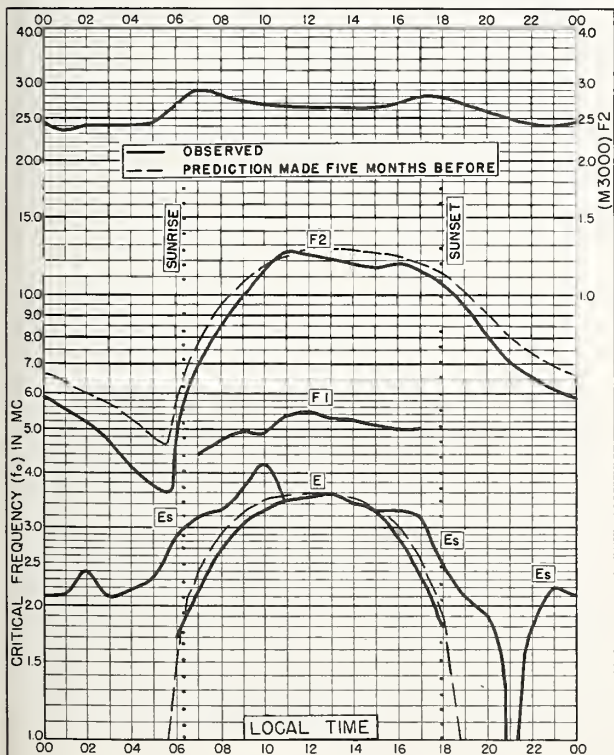


Fig. 107. SLOUGH, ENGLAND  
51.5°N, 0.6°W

MARCH 1957

NBS 503

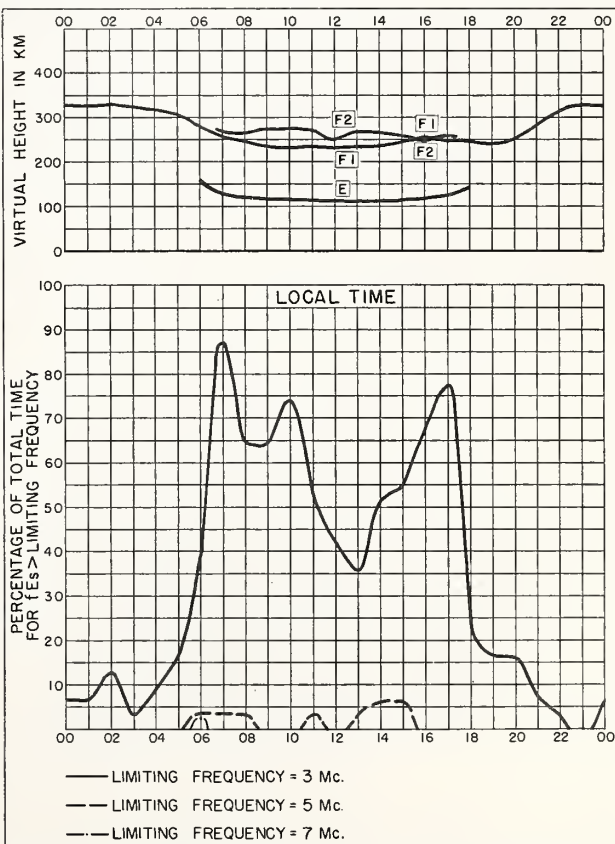


Fig. 108. SLOUGH, ENGLAND

MARCH 1957

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957



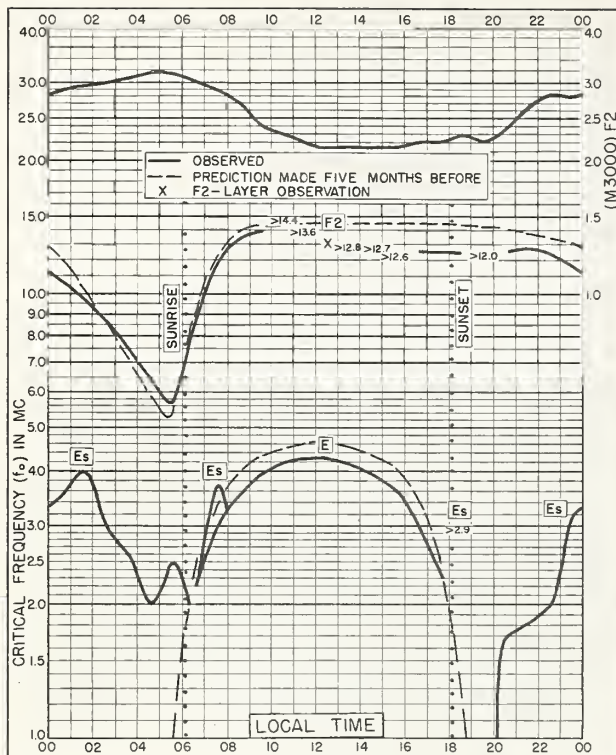


Fig. 109. TALARA, PERU  
4.6°S, 81.3°W

MARCH 1957

NBS 503

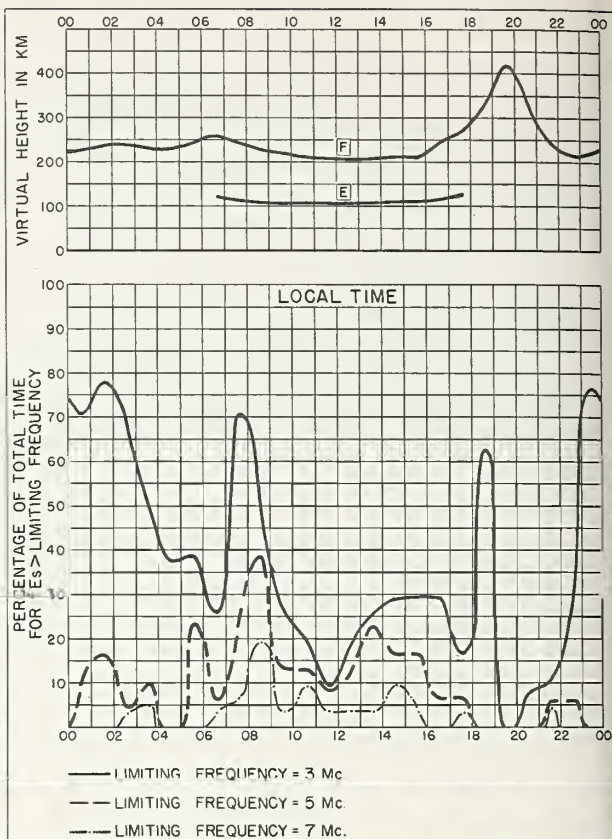


Fig. 110. TALARA, PERU

MARCH 1957

NBS 490

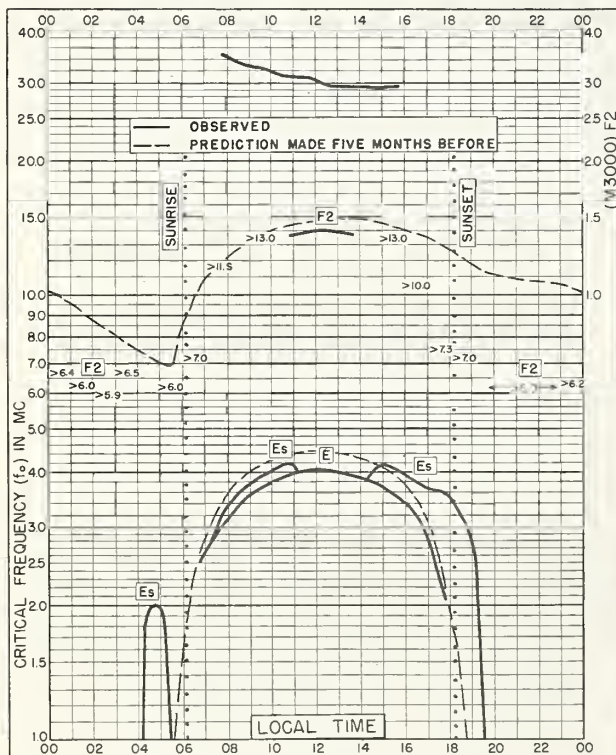


Fig. 111. TOWNSVILLE, AUSTRALIA  
19.3°S, 146.7°E

MARCH 1957

NBS 503

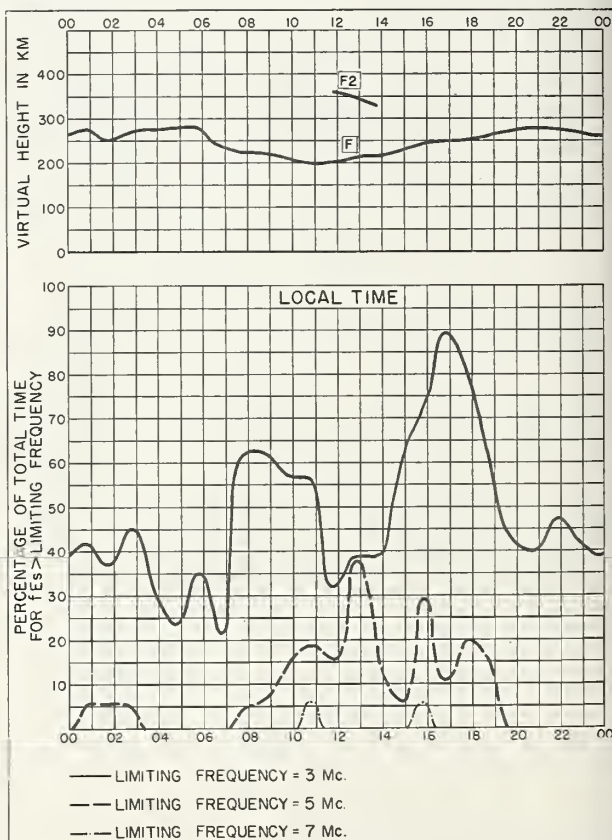


Fig. 112. TOWNSVILLE, AUSTRALIA

MARCH 1957

NBS 490

N. S. INTERNATIONAL PHYSICAL OFFICE 11/1977

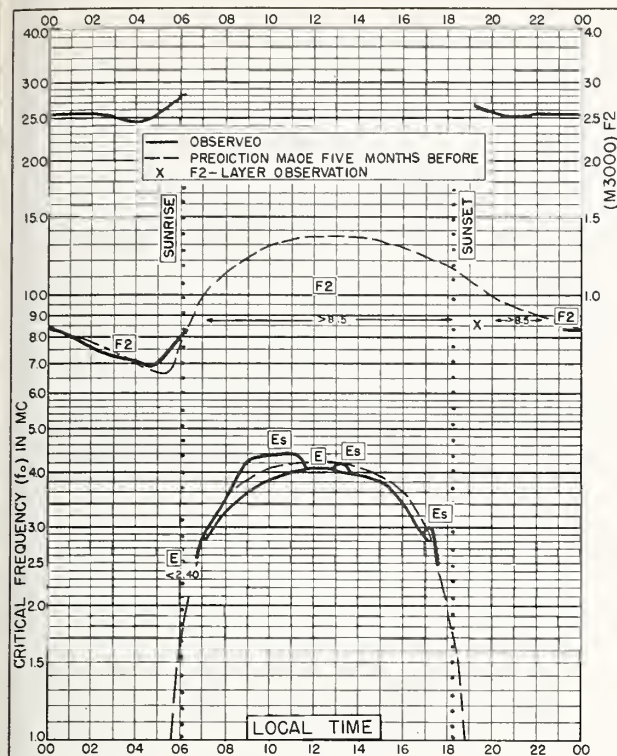


Fig. 113. BRISBANE, AUSTRALIA  
27.5°S, 152.9°E

MARCH 1957

NBS 503

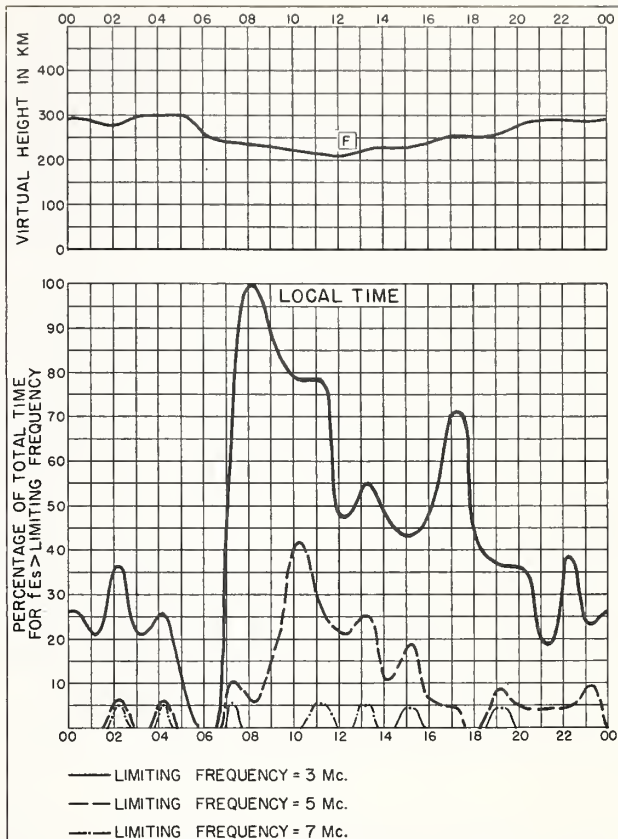


Fig. 114. BRISBANE, AUSTRALIA

MARCH 1957

NBS 490

NBS 503

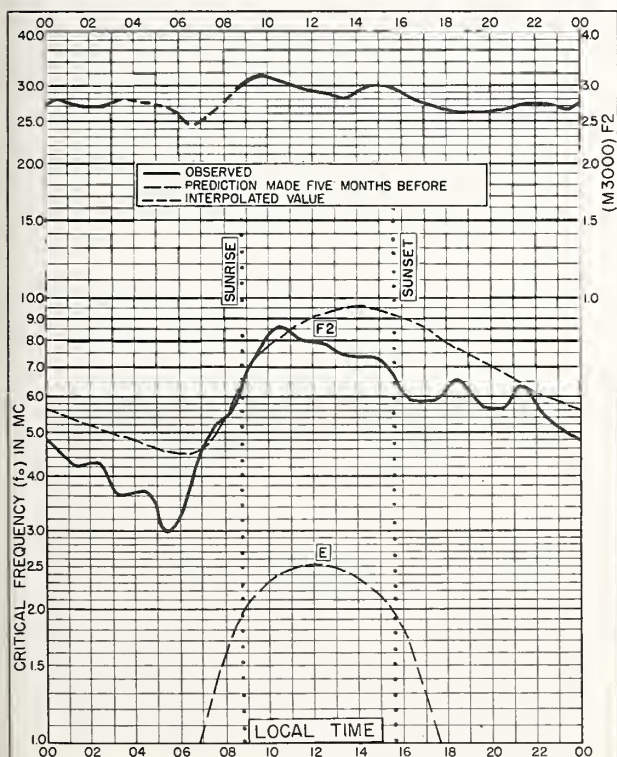


Fig. 115. GODHAVN, GREENLAND  
69.2°N, 53.5°W

FEBRUARY 1957

NBS 503

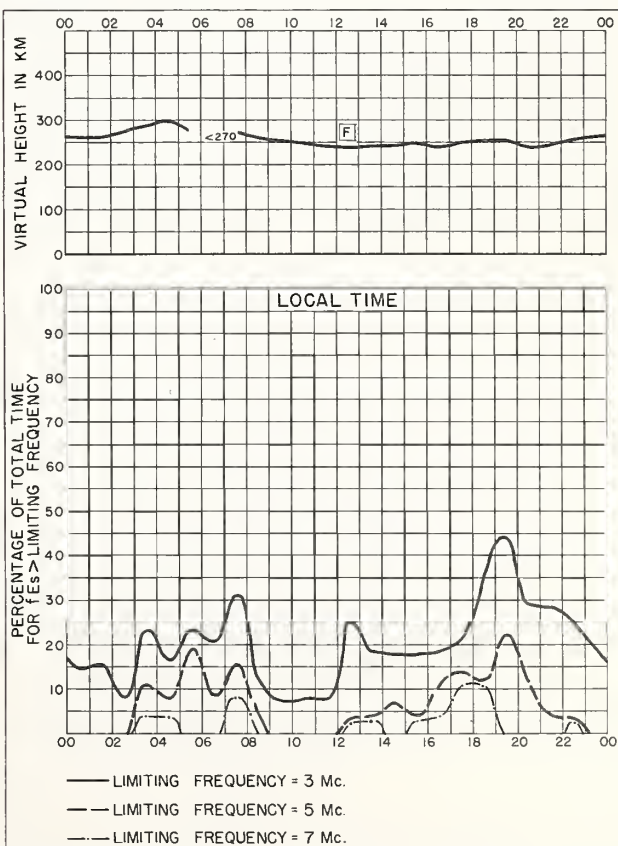


Fig. 116. GODHAVN, GREENLAND

FEBRUARY 1957

NBS 490



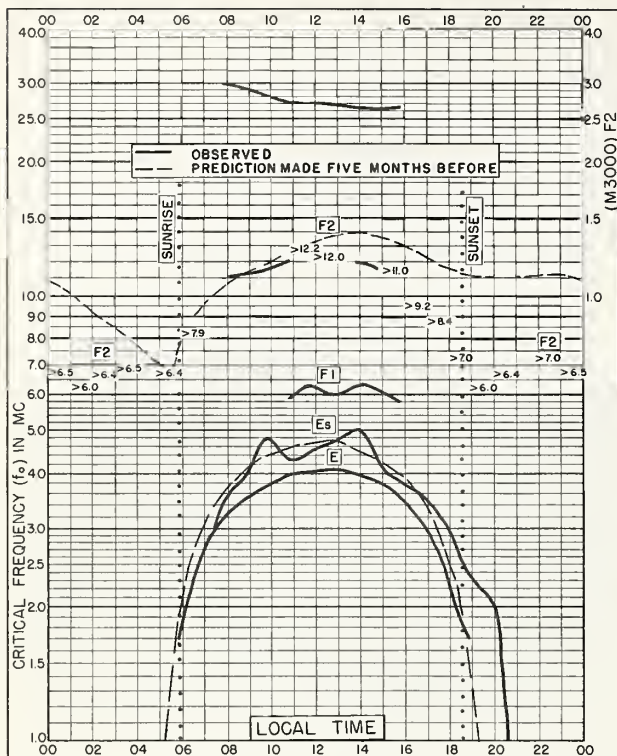


Fig. 117. TOWNSVILLE, AUSTRALIA  
19.3°S, 146.7°E FEBRUARY 1957

NBS 503

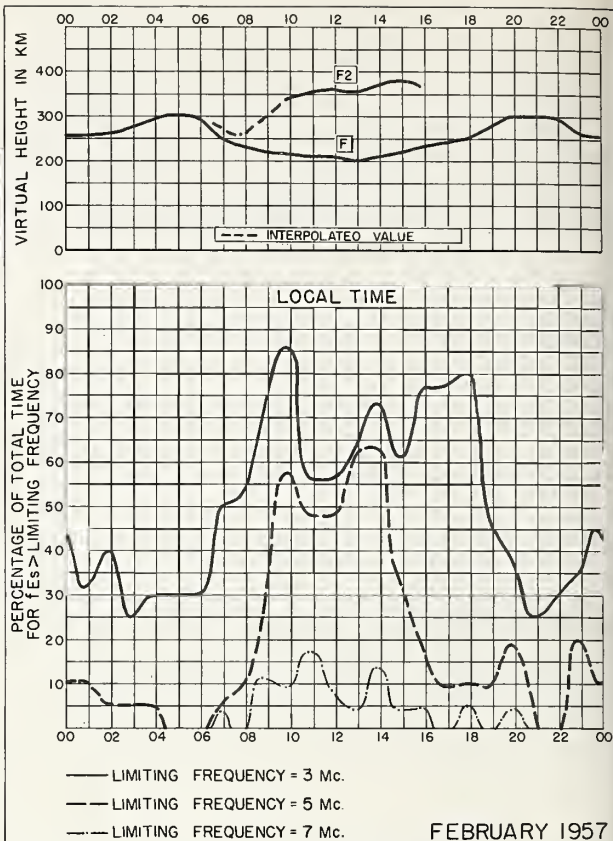


Fig. 118. TOWNSVILLE, AUSTRALIA

FEBRUARY 1957

COMMERCIAL STANDARD BROADCASTING, U.S.A.

NBS 490

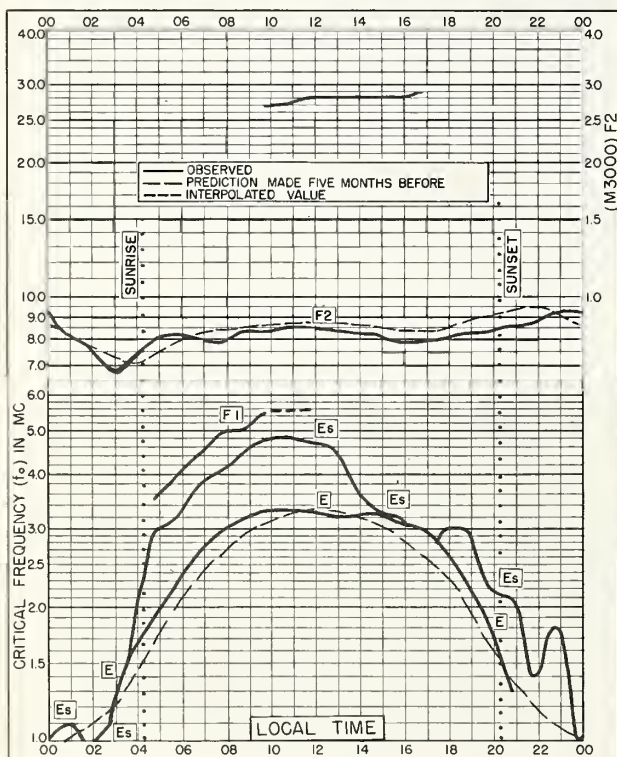


Fig. 119. PORT LOCKROY  
64.8°S, 63.5°W FEBRUARY 1957

NBS 503

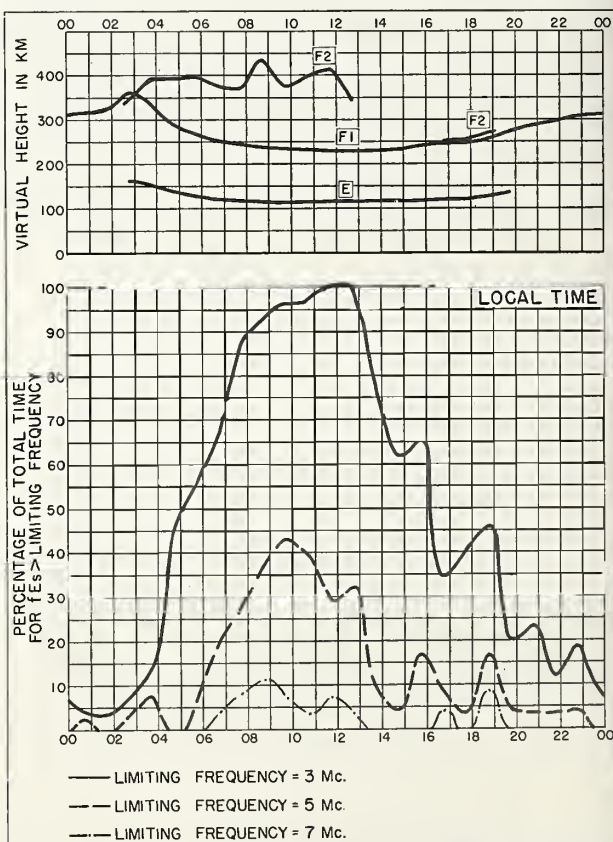


Fig. 120. PORT LOCKROY FEBRUARY 1957

NBS 490

U.S. GOVERNMENT PRINTING OFFICE: 1957



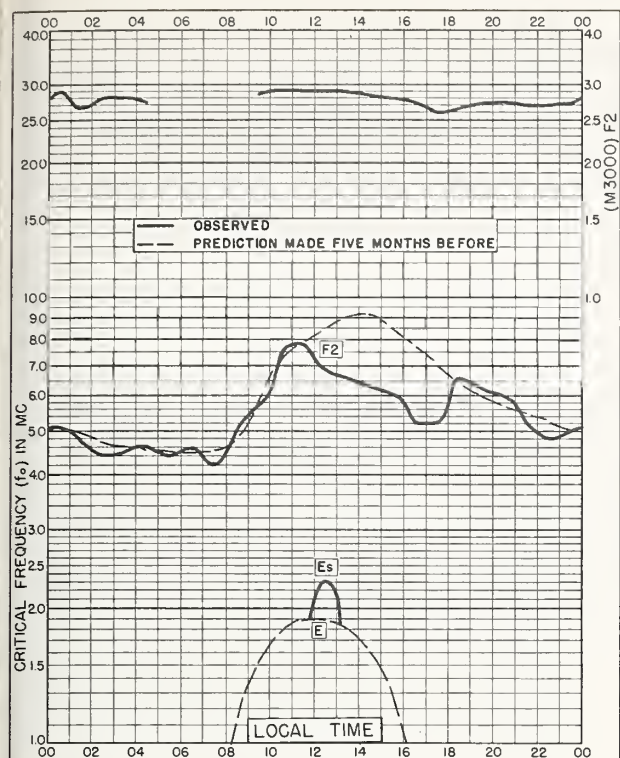


Fig. 121. GODHAVN, GREENLAND  
69.2°N, 53.5°W JANUARY 1957

NBS 503

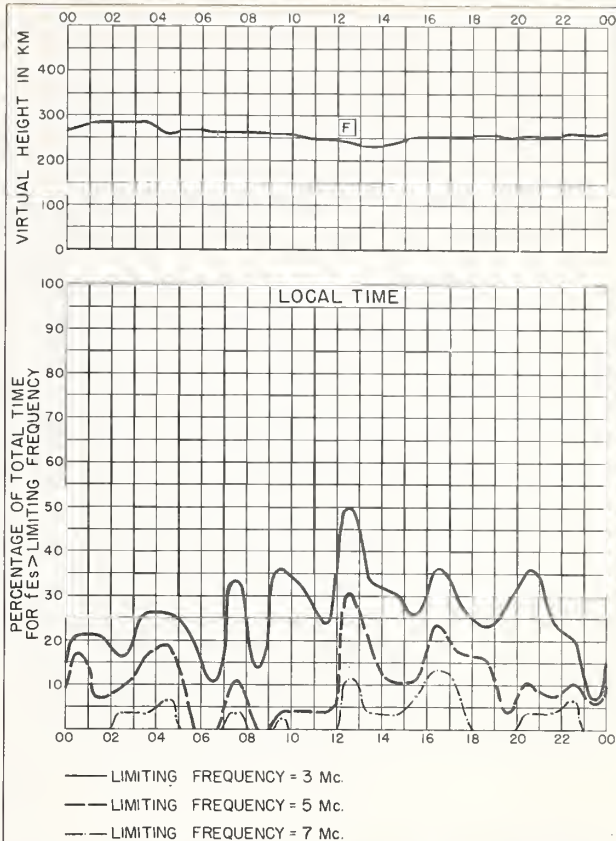


Fig. 122. GODHAVN, GREENLAND JANUARY 1957

Communications-Builder, Cite.

NBS 490

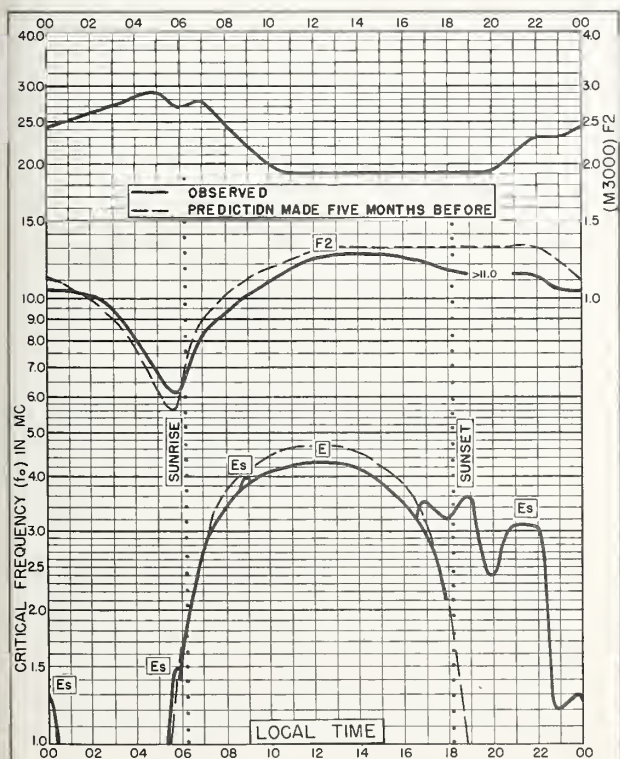


Fig. 123. SINGAPORE, BRITISH MALAYA  
1.3°N, 103.8°E JANUARY 1957

NBS 503

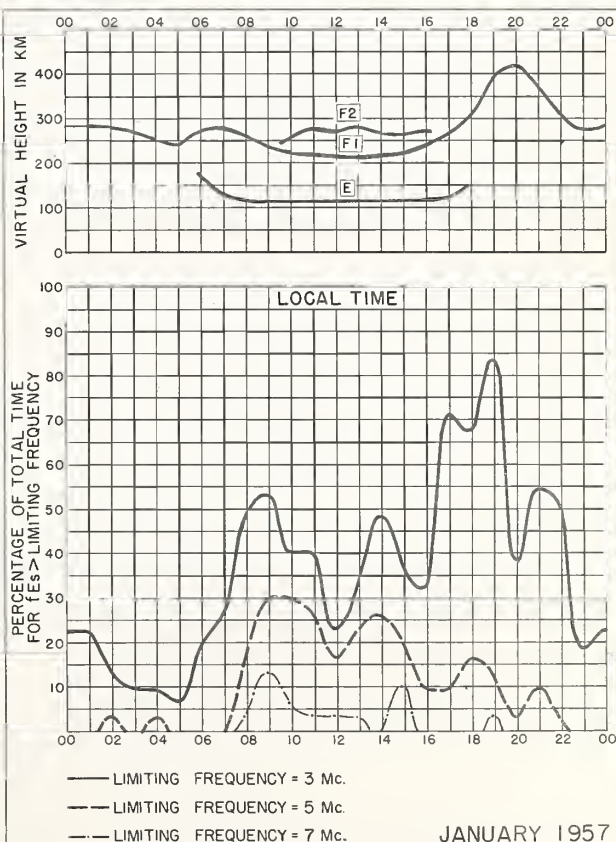


Fig. 124. SINGAPORE, BRITISH MALAYA

JANUARY 1957

NBS 490

U.S. GOVERNMENT PRINTING OFFICE 315771

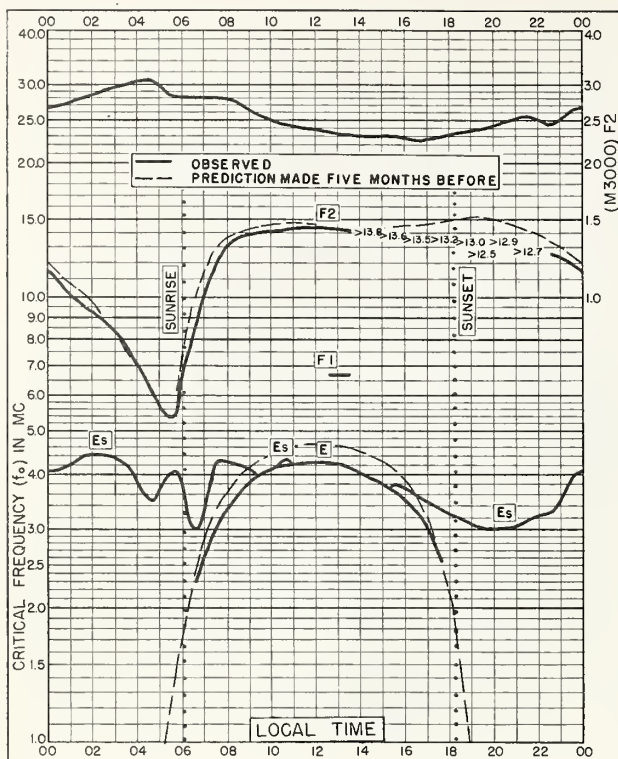


Fig. 125. TALARA, PERU

4.6°S, 81.3°W

JANUARY 1957

NBS 503

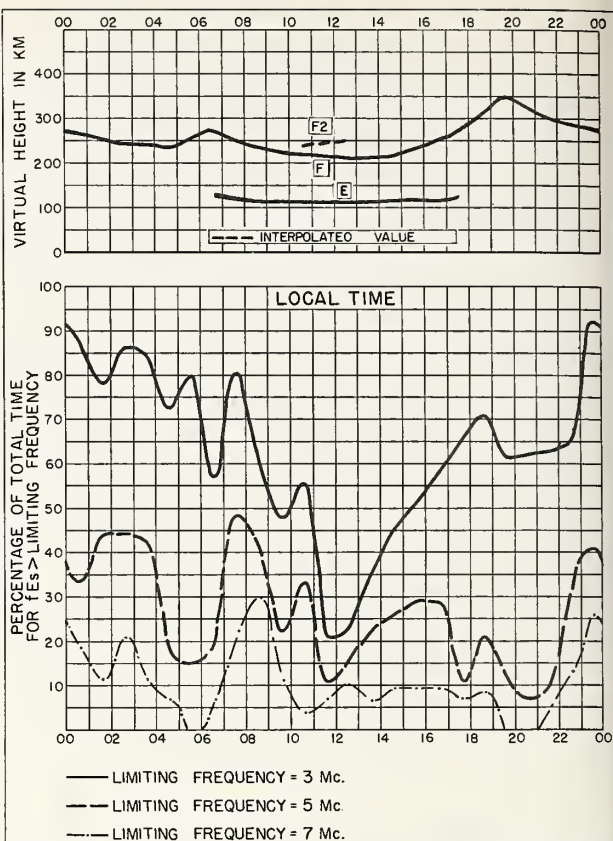


Fig. 126. TALARA, PERU

JANUARY 1957

NBS 490

N. S. INTERNATIONAL PHYSICAL OFFICE 51077

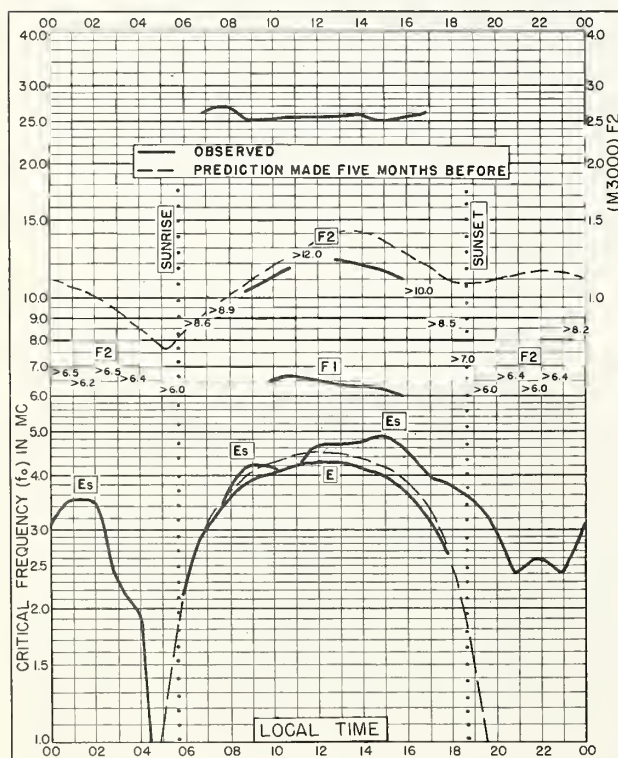


Fig. 127. TOWNSVILLE, AUSTRALIA

19.3°S, 146.7°E

JANUARY 1957

NBS 503

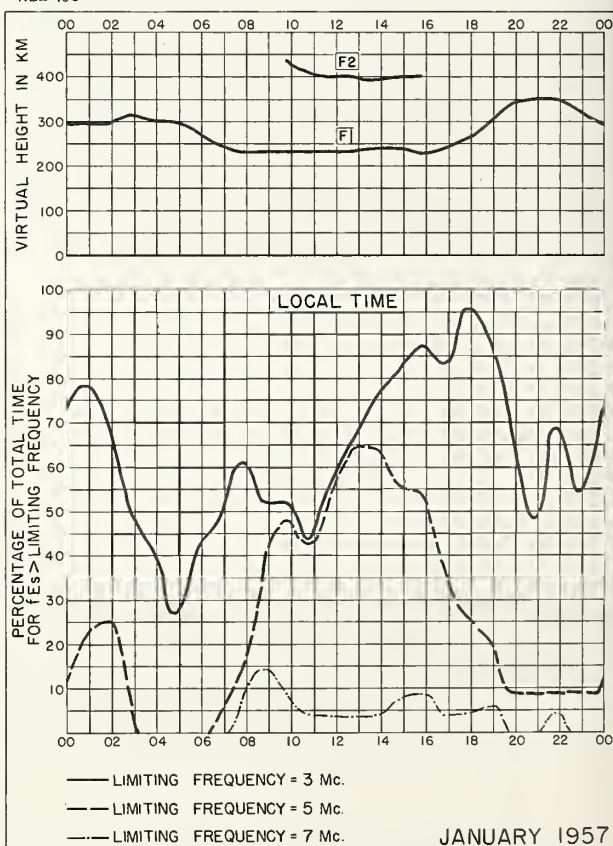


Fig. 128. TOWNSVILLE, AUSTRALIA

JANUARY 1957

Cintreiros-Balboa-Bonilla, Ciba

NBS 490



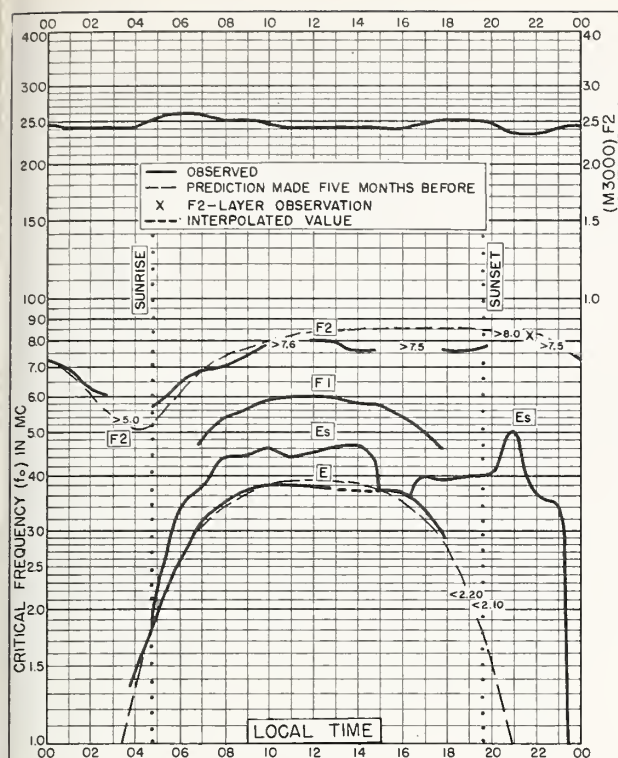


Fig. 129. HOBART, TASMANIA  
42.9°S, 147.2°E

JANUARY 1957

NBS 503

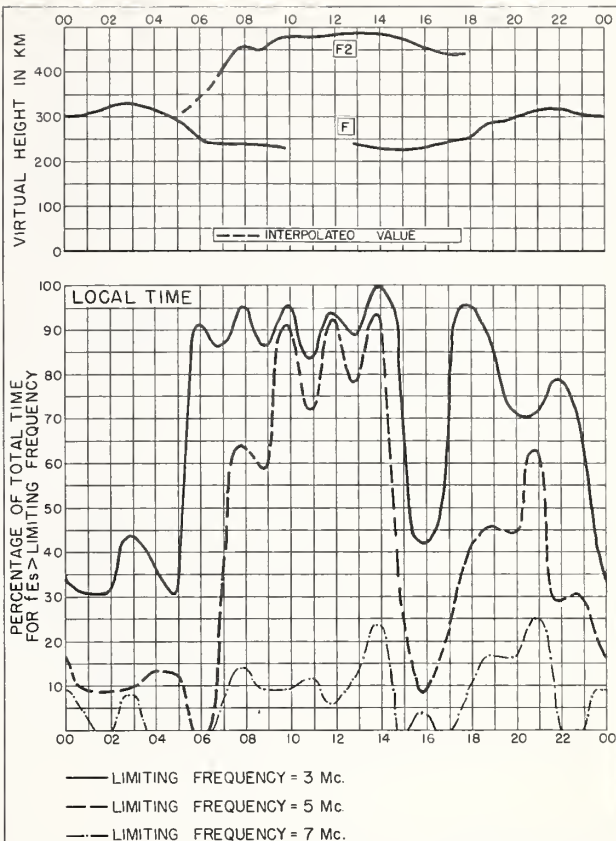


Fig. 130. HOBART, TASMANIA

JANUARY 1957

NBS 490

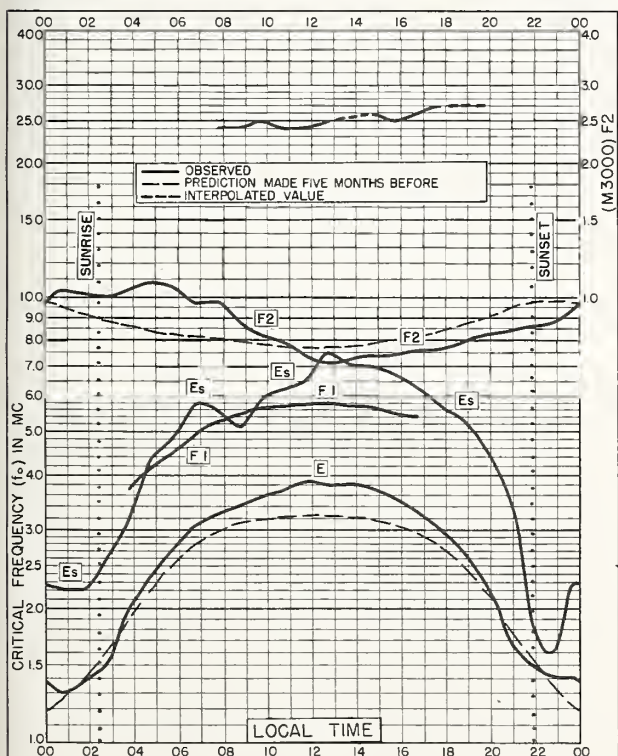


Fig. 131. PORT LOCKROY  
64.8°S, 63.5°W

JANUARY 1957

NBS 503

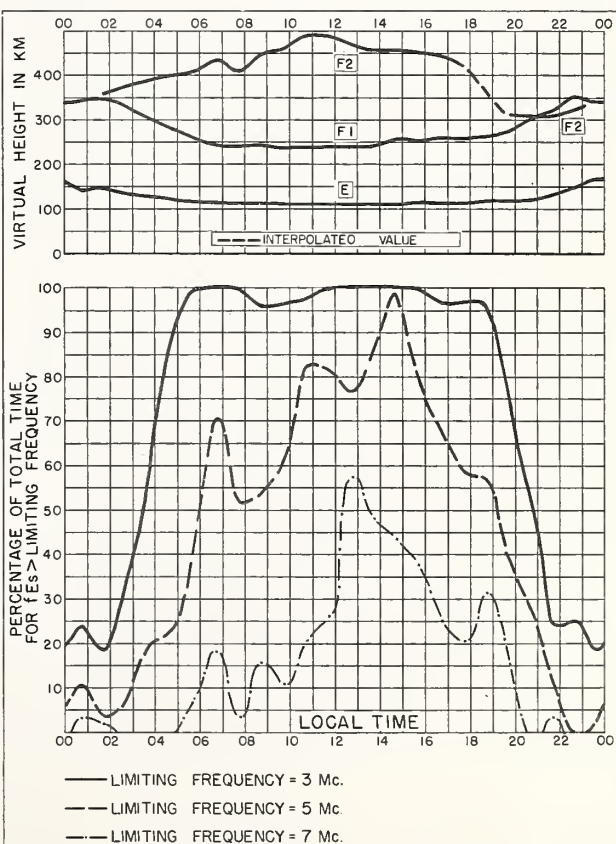


Fig. 132. PORT LOCKROY

JANUARY 1957

NBS 490

U.S. GOVERNMENT PRINTING OFFICE: 1957



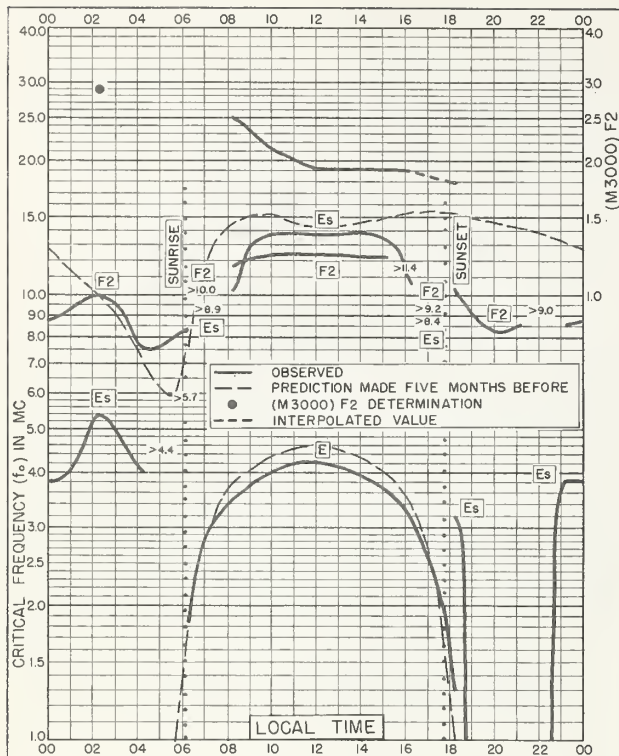


Fig. 133. IBADAN, NIGERIA

7.4°N, 4.0°E

DECEMBER 1956

NBS 503

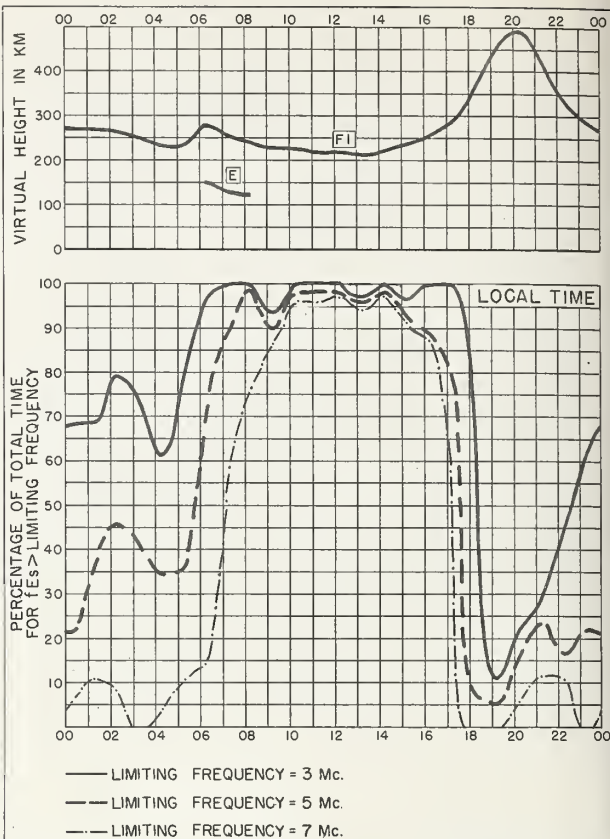


Fig. 134. IBADAN, NIGERIA

DECEMBER 1956

NBS 490

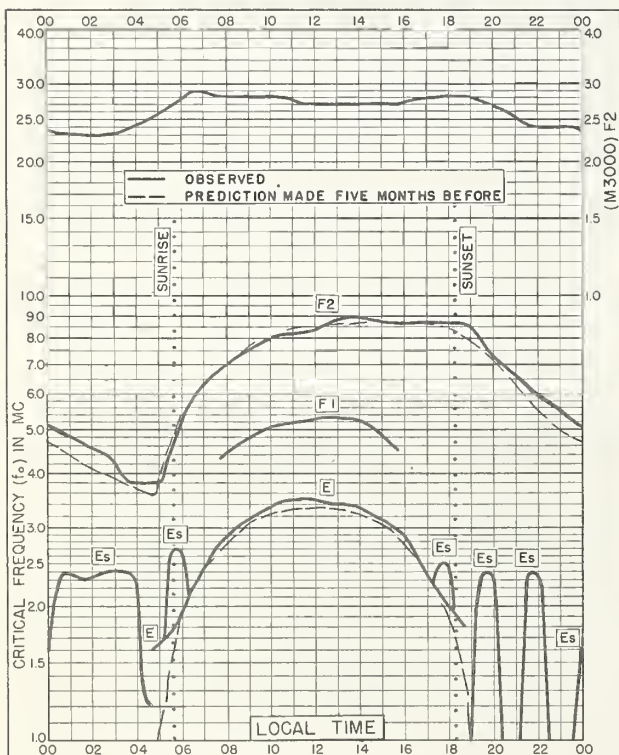


Fig. 135. INVERNESS, SCOTLAND

57.4°N, 4.2°W

SEPTEMBER 1956

NBS 503

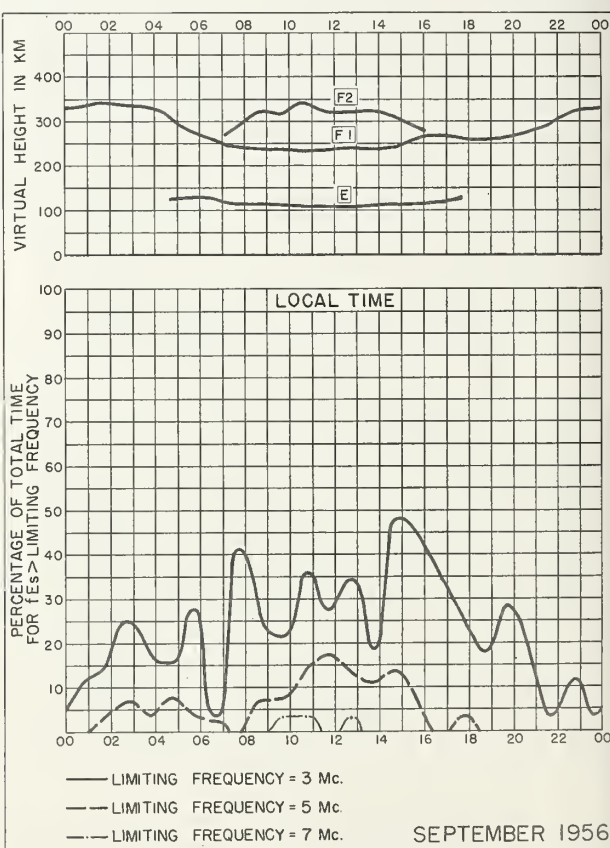


Fig. 136. INVERNESS, SCOTLAND

SEPTEMBER 1956

NBS 490

NBS 490

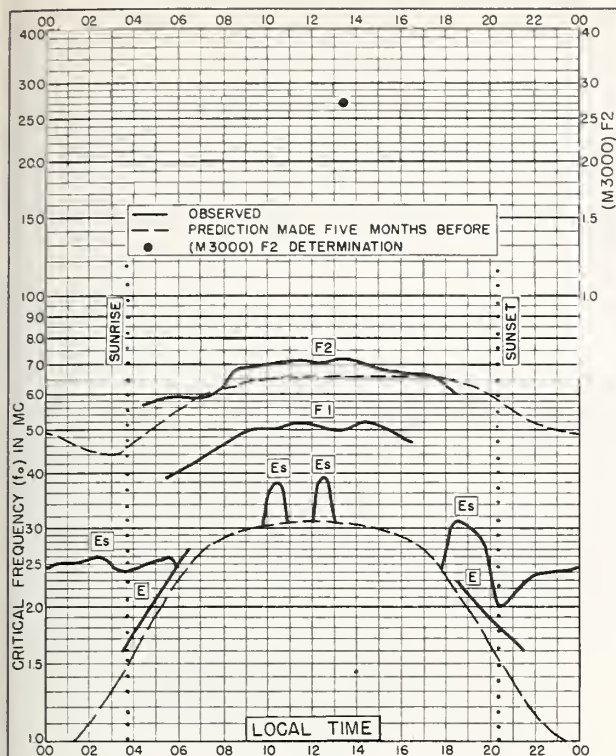


Fig. 137. LULEA, SWEDEN  
65.6°N, 22.1°E

AUGUST 1956

NBS 503

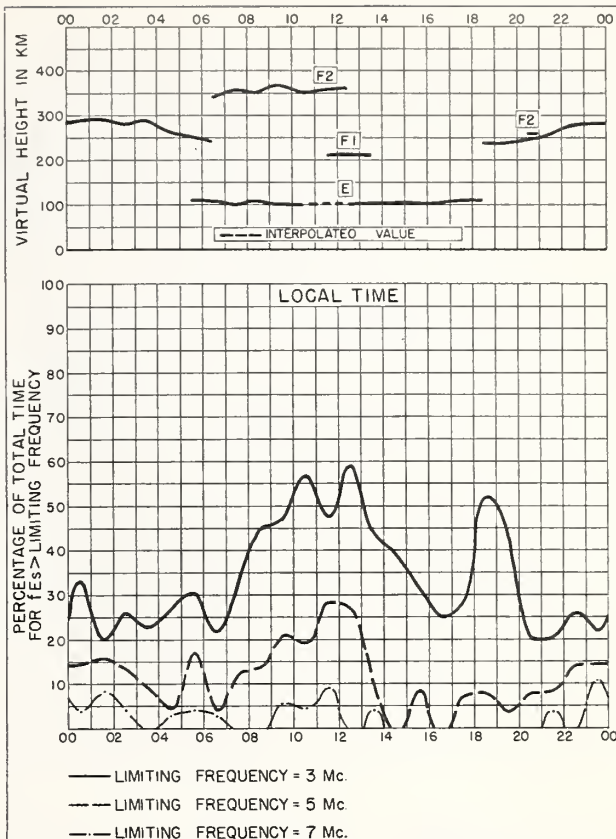


Fig. 138. LULEA, SWEDEN

AUGUST 1956

NBS 490

N. S. INTERNATIONAL RESEARCH OFFICE 7/20/57

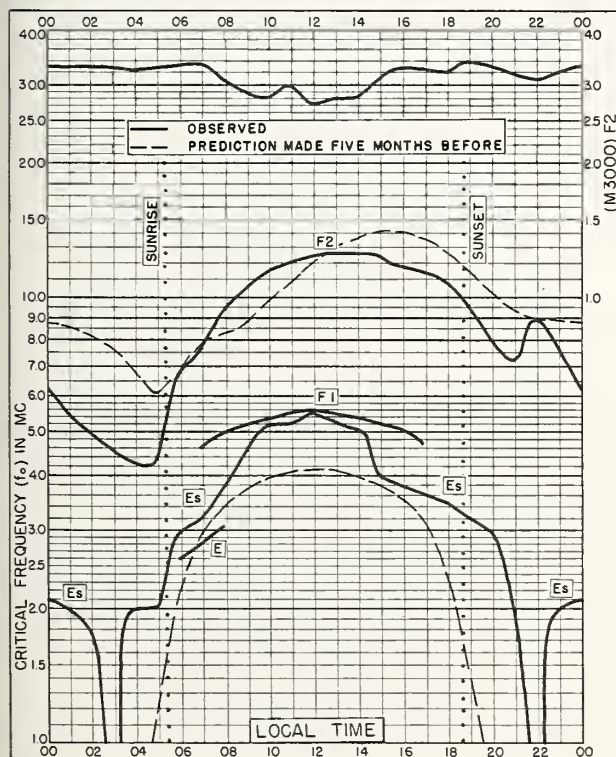


Fig. 139. CALCUTTA, INDIA  
22.9°N, 88.5°E

JULY 1956

NBS 503

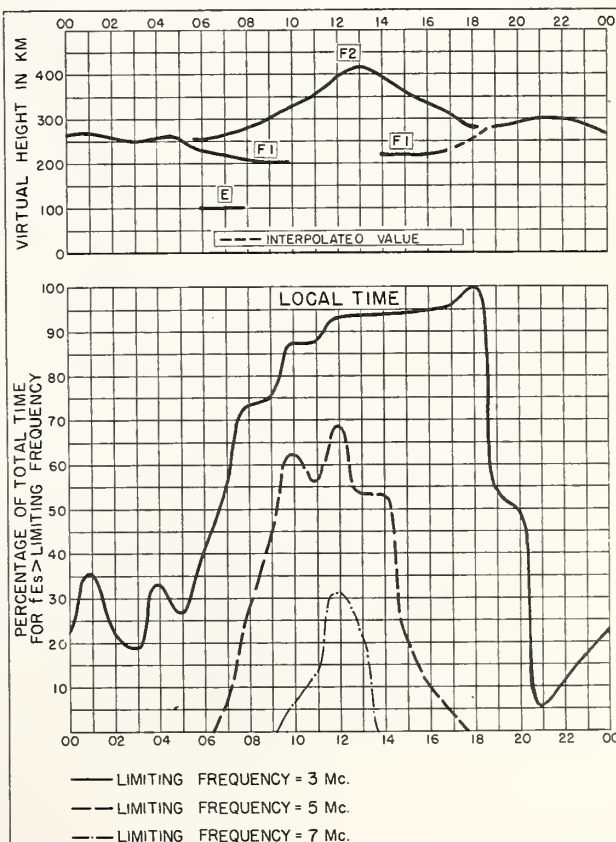


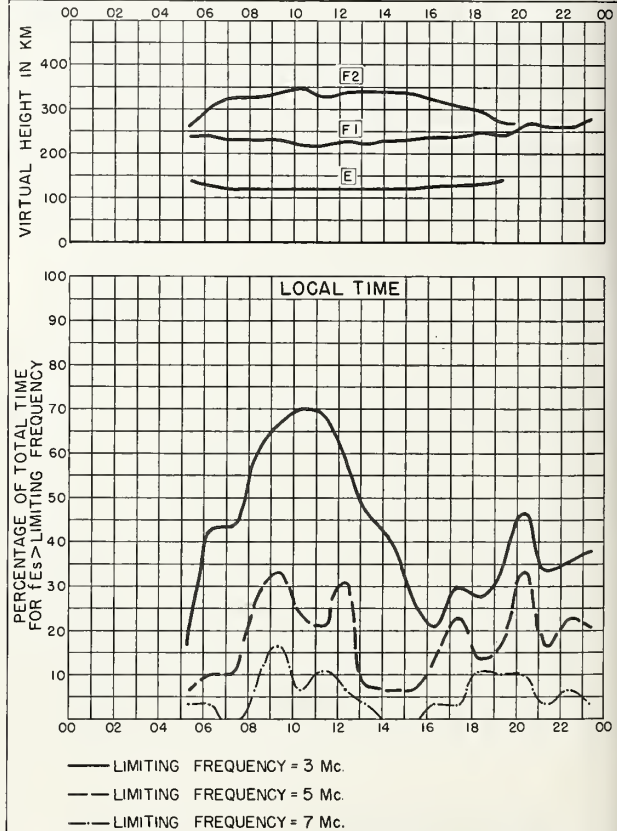
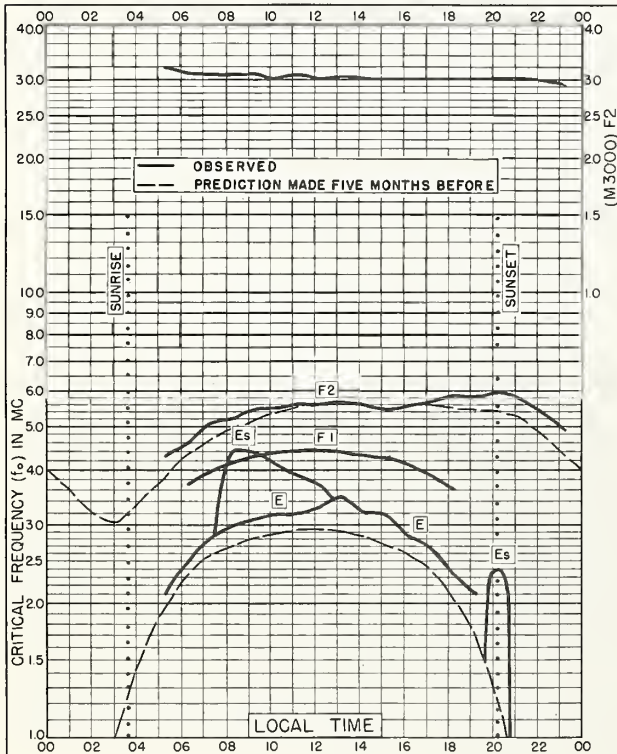
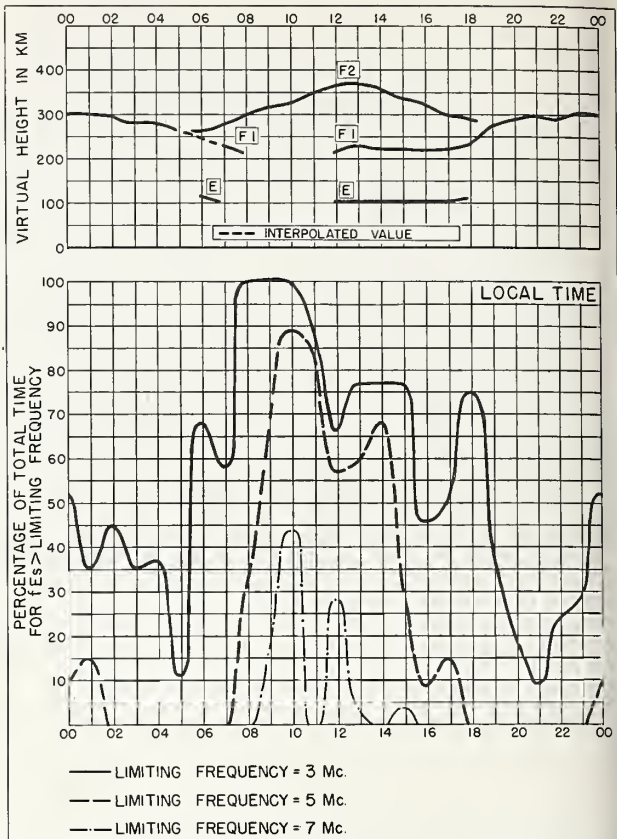
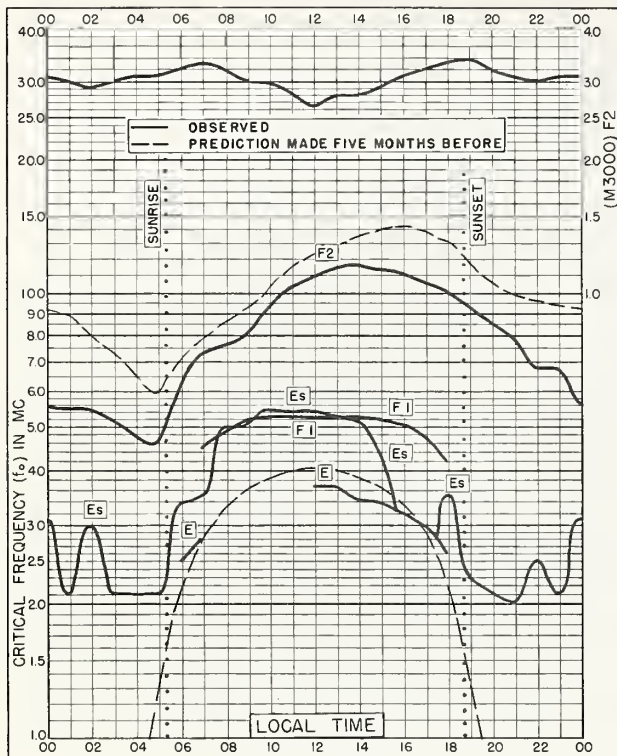
Fig. 140. CALCUTTA, INDIA

JULY 1956

NBS 490

N. S. INTERNATIONAL RESEARCH OFFICE 7/20/57







Index of Tables and Graphs of Ionospheric Data

in CRPL-F158 (Part A)

	<u>Table page</u>	<u>Figure page</u>
Adak, Alaska		
June 1957 . . . . .	20	36
Akita, Japan		
May 1957. . . . .	23	44
Anchorage, Alaska		
June 1957 . . . . .	20	35
Baguio, P. I.		
May 1957. . . . .	24	46
Baker Lake, Canada		
May 1957. . . . .	22	41
Brisbane, Australia		
May 1957. . . . .	25	50
April 1957. . . . .	27	56
March 1957. . . . .	28	59
Calcutta, India		
July 1956 . . . . .	30	65
June 1956 . . . . .	30	66
Campbell I.		
December 1954 . . . . .	30	66
Capetown, Union of S. Africa		
May 1957. . . . .	25	50
Churchill, Canada		
May 1957. . . . .	22	41
April 1957. . . . .	26	52
Elisabethville, Belgian Congo		
May 1957. . . . .	24	48
April 1957. . . . .	26	54
Formosa, China		
August 1957 . . . . .	19	31
June 1957 . . . . .	21	37
May 1957. . . . .	23	45
Godhavn, Greenland		
April 1957. . . . .	26	52
March 1957. . . . .	27	57
February 1957 . . . . .	28	59
January 1957. . . . .	29	61
Hobart, Tasmania		
January 1957. . . . .	29	63
Huancayo, Peru		
June 1957 . . . . .	21	38
May 1957. . . . .	24	48
April 1957. . . . .	26	54

Index (CRPL-F158 (Part A), continued)

	<u>Table page</u>	<u>Figure page</u>
Ibadan, Nigeria		
December 1956. . . . .	30	64
Inverness, Scotland		
September 1956 . . . . .	30	64
Johannesburg, Union of S. Africa		
May 1957 . . . . .	25	49
Kiruna, Sweden		
July 1957. . . . .	19	32
June 1957. . . . .	20	35
May 1957 . . . . .	22	40
Leopoldville, Belgian Congo		
May 1957 . . . . .	24	47
April 1957 . . . . .	26	53
Lulea, Sweden		
August 1956. . . . .	30	65
Lycksele, Sweden		
July 1957. . . . .	19	32
May 1957 . . . . .	22	40
Nairobi, Kenya		
May 1957 . . . . .	24	46
Ottawa, Canada		
May 1957 . . . . .	23	43
Panama Canal Zone		
June 1957. . . . .	21	38
Point Barrow, Alaska		
June 1957. . . . .	20	34
Port Lockroy		
February 1957. . . . .	28	60
January 1957 . . . . .	29	63
Rarotonga I.		
April 1957 . . . . .	27	55
Resolute Bay, Canada		
May 1957 . . . . .	21	39
April 1957 . . . . .	25	51
San Francisco, California		
June 1957. . . . .	20	36
Schwarzenburg, Switzerland		
May 1957 . . . . .	22	42
Scott Base		
May 1957 . . . . .	25	51
April 1957 . . . . .	27	56
Singapore, British Malaya		
January 1957 . . . . .	29	61
Slough, England		
March 1957 . . . . .	27	57

Index (CRPL-F158 (Part A), concluded)

	<u>Table page</u>	<u>Figure page</u>
Talara, Peru		
May 1957 . . . . .	24	47
April 1957 . . . . .	26	53
March 1957 . . . . .	28	58
January 1957 . . . . .	29	62
Thule, Greenland		
June 1957. . . . .	20	34
Tokyo, Japan		
May 1957 . . . . .	23	44
Townsville, Australia		
May 1957 . . . . .	25	49
April 1957 . . . . .	27	55
March 1957 . . . . .	28	58
February 1957. . . . .	28	60
January 1957 . . . . .	29	62
Tromso, Norway		
May 1957 . . . . .	21	39
Upsala, Sweden		
August 1957. . . . .	19	31
July 1957. . . . .	19	33
Wakkanai, Japan		
May 1957 . . . . .	23	43
Washington, D. C.		
July 1957. . . . .	19	33
White Sands, New Mexico		
June 1957. . . . .	21	37
Winnipeg, Canada		
May 1957 . . . . .	22	42
Yamagawa, Japan		
May 1957 . . . . .	23	45





---

## CRPL Reports

[A detailed list of CRPL publications is available from the Central Radio Propagation Laboratory upon request]

### *Daily:*

Radio disturbance forecasts, every half hour from broadcast stations WWV and WWVH of the National Bureau of Standards.

Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

### *Semiweekly:*

CRPL—J. North Atlantic Radio Propagation Forecast (of days most likely to be disturbed during following month).

CRPL—Jp. North Pacific Radio Propagation Forecast (of days most likely to be disturbed during following month).

### *Semimonthly:*

CRPL—Ja. Semimonthly Frequency Revision Factors For CRPL Basic Radio Propagation Prediction Reports.

### *Monthly:*

CRPL—D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11-499-, monthly supplements to TM 11-499; Dept. of the Air Force, TO 31-3-28 series). On sale by Superintendent of Documents.\* Members of the Armed Forces should address cognizant military office.

CRPL—F. (Part A). Ionospheric Data.  
(Part B). Solar-Geophysical Data.

Limited distribution. These publications are in general disseminated only to those individuals or scientific organizations which collaborate in the exchange of ionospheric, solar, geomagnetic or other radio propagation data or in exchange for copies of publications on radio, physics, and geophysics for the CRPL library.

The publications listed above may be obtained without charge from the Central Radio Propagation Laboratory, National Bureau of Standards, Boulder Laboratories, Boulder, Colorado, unless otherwise indicated. Please note that the F series is not generally available.

---

### *Circulars of the National Bureau of Standards pertaining to Radio Sky Wave Transmission:*

NBS Circular 462. Ionospheric Radio Propagation. \$1.25.

NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions. 30 cents.

NBS Circular 557. Worldwide Radio Noise Levels Expected in the Frequency Band 10 Kilocycles to 100 Megacycles. 30 cents.

NBS Circular 582. Worldwide Occurrence of Sporadic E. \$3.25.

These Circulars are on sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Members of the Armed Forces should address the respective military office having cognizance of radio wave propagation.

---

\* For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. Price 10 cents (single copy). Subscription Price: \$1.00 a year; 25 cents additional for foreign mailing.

